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## SEARCH REQUEST FORM

Scientific and Technical Information Center

Requester's Full Name: David H. Kipka Examiner #: 62775 Date: 3-10-03  
 Art Unit: 1712 Phone Number 30 5-5793 Serial Number: 69/987327  
 Mail Box and Bldg/Room Location: CP2 7526 Results Format Preferred (circle): PAPER DISK E-MAIL

If more than one search is submitted, please prioritize searches in order of need.

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: Soft Cr-Correlating Steel

Inventors (please provide full names): Atsushi Miyazaki, Junichi Inoue, Masao Muraki, Yoshinori Yaezaki, Osamu Furukawa

Earliest Priority Filing Date: 11/15/2000 JP/US20020098104

\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.

Cr correlating steel having "Laves phase"  
 and Nb. by weight

C and C<sub>22</sub> Mn < 2.0

Cr 12-16

Ni 0.5-1.0 ✓ Bal Fe

Nb 10-20

Nb < 0.02 ✓

Si 0.05-0.5

Cu 0.05-1.0

Ti 0.12-0.50

V 0.02-0.50

W 0.5-2.00

Al 0.02-0.5

REM 0.03-0.10

Zr 0.05-0.5

alternatively  
 present  
 not

## STAFF USE ONLY

## Type of Search

## Vendors and cost where applicable

Searcher: J. Calme NA Sequence (#) STN  
 Searcher Phone #: 308-4129 AA Sequence (#) Dialog  
 Searcher Location: 3/14/03 Structure (#) Questel/Orbit  
 Date Searcher Picked Up: 3/14/03 Bibliographic ✓ Dr. Link Lexis/Nexis  
 Date Completed: 3/14/03 Litigation Fulltext Sequence Systems WWW/Internet  
 Searcher Prep & Review Time: 120 min Patent Family Other (specify)  
 Clerical Prep Time: 70 min Other reg file-dictionary search  
 Online Time: 70 min

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Dave,

Just a quick note. On your search request form you indicated that the alloy has to contain very small amounts of carbon and nitrogen (.02). The registry file will not list the carbon or nitrogen when they are less than .1 amount.

For example, the registry numbers for the iron alloys for this application (L3), did NOT list carbon or nitrogen in the alloy composition. As a result I searched the claims 2 ways.

I searched for the fe alloy with N2 and C, and without it. For the alloys (without the N2 or C) I searched text for carbon and nitrogen as well as used the registry number for N2 and C because CA will sometimes index the registry number for the ELEMENT

I also searched for laves phase, solid solution, or intermetallic.

If you have any questions, please call me.

John

PS - at the end of this printout are a couple of registry records for an alloy.

=> d his

FILE 'HCA' ENTERED AT 08:45:21 ON 14 MAR 2003

E US20020098107/PN

L1

1 S E3

SEL L1 RN

FILE 'REGISTRY' ENTERED AT 08:45:51 ON 14 MAR 2003

L2

22 S E1-E22

L3

18 S L2 NOT (7440-32-6/RN OR 12597-68-1/RN OR 7440-42-8/RN OR 7440

FILE 'HCA' ENTERED AT 08:48:41 ON 14 MAR 2003

L4

1 S L3

FILE 'REGISTRY' ENTERED AT 09:11:54 ON 14 MAR 2003

L5

5191 S FE 50-90/MAC AND CR 12-16/MAC AND SI .1-5/MAC AND NB .1-2/MAC

L6

4700 S L5 AND MN 0-2/MAC

L7

1406 S L6 AND NI 0-1/MAC

L8

210150 S C/MAC

L9

32606 S N/MAC

L10

835 S L7 AND L8

L11

344 S L10 AND L9

FILE 'HCA' ENTERED AT 09:20:18 ON 14 MAR 2003

L12

591 S L11

L13

36371 S LAV?

L14

1 S L12 AND L13

L15

5338 S LAVE###

L16

1 S L12 AND L15

L17

1493705 S PHASE?

L18

49 S L12 AND L17

FILE 'REGISTRY' ENTERED AT 09:25:39 ON 14 MAR 2003

L19 71376 S 0-1 CU/MAC  
L20 44213 S 0-.5 TI/MAC  
L21 45891 S 0-.5 V/MAC  
L22 29379 S .5-5 W/MAC  
L23 14824 S 0-.5/AL  
L24 137332 S (B3 OR T3)/PG AND AYS/CI  
L25 23469 S 0-.5 ZR/MAC  
L26 228 S L11 AND L22  
L27 61 S L26 AND L19  
L28 16 S L27 AND L20  
L29 14 S L28 AND L21  
L30 0 S L29 AND L23  
L31 14 S L29 AND L24  
L32 7 S L31 AND L25  
L33 0 S L27 AND L23  
L34 0 S L27 AND L23  
L35 0 S L11 AND L23

FILE 'HCA' ENTERED AT 09:34:43 ON 14 MAR 2003

L36 153 S L26  
L37 52 S L27  
L38 16 S L28  
L39 15 S L29  
L40 15 S L31  
L41 7 S L32

FILE 'REGISTRY' ENTERED AT 09:36:14 ON 14 MAR 2003

L42 81672 S L24 NOT W/MAC  
L43 0 S L29 AND L42  
L44 0 S L27 AND L42  
L45 0 S L26 AND L42  
L46 29 S L10 AND L42  
L47 15 S L11 AND L42  
L48 39 S L7 AND (L22 AND L19 AND L20 AND L21)  
L49 0 S L48 AND L23  
L50 25 S L48 AND L25  
L51 0 S L50 AND L42

FILE 'HCA' ENTERED AT 09:40:52 ON 14 MAR 2003

L52 65 S L48  
L53 25 S L50  
L54 40 S L52 AND (C OR CARBON#)  
L55 29 S L54 AND (N OR NITROGEN#)  
L56 24 S L53 AND (C OR CARBON#)  
L57 22 S L56 AND (N OR NITROGEN#)

FILE 'REGISTRY' ENTERED AT 09:42:48 ON 14 MAR 2003

L58 1 S CARBON/CN  
L59 1 S NITROGEN/CN

FILE 'HCA' ENTERED AT 09:43:07 ON 14 MAR 2003

L60 243135 S L58  
L61 224704 S L59  
L62 7 S L52 AND (L60 OR L61)  
L63 16 S L38 OR L39 OR L40 OR L41  
L64 36 S L37 NOT L63

L65 36 S L64 NOT L62  
L66 36 S L64 NOT L57  
L67 90770 S FERRIT?  
L68 0 S L16 AND L67  
L69 0 S L64 AND L68  
L70 3 S L62 AND L67  
L71 9 S L57 AND L67

FILE 'LCA' ENTERED AT 09:49:46 ON 14 MAR 2003

L72 925 S STAINLESS(2N)STEEL? OR (IRON OR FE) (2N) (ALLOY? OR AMALGAM#)  
L73 133 S INTERMETAL? OR INTERMEDIAT?(2N) PHAS?  
L74 335 S (SOLID OR S OR SOL#) (2N) PHASE?

FILE 'HCA' ENTERED AT 09:57:55 ON 14 MAR 2003

L75 14 S L37 AND L72  
L76 0 S L63 AND L73  
L77 0 S L63 AND L74  
L78 0 S L37 AND (L73 OR L74)  
L79 5 S L75 NOT L63  
L80 21 S L63 OR L75 OR L79  
L81 12 S L70 OR L71  
L82 13 S L57 NOT L81

=> d L80 1-21 cbib abs hitind hitrn

L80 ANSWER 1 OF 21 HCA COPYRIGHT 2003 ACS

138:156870 Martensitic **stainless steel** having high strength and corrosion resistance. Zheng, Zairong (Puxiang Inst. of Industrial Sciences, Peop. Rep. China). Faming Zhuanli Shenqing Gongkai Shuomingshu CN 1352319 A ~~20020605~~, 11 pp. (Chinese). CODEN: CNXXEV. APPLICATION: CN 2000-132453 20001115.

AB The steel comprises C <0.06, Si <2.5, Mn <2.5, Ni 1-6, Cr 10-19, W 0.5-6, Mo <3.5, Nb <0.5, V <0.5, Cu <3, N 0.05-0.25, and Fe bal. The steel may further contain 0.8% Ti and/or 1% Ta. The steel is manufd. by melting, austempering at 800-1150.degree., and/or tempering at 350-575.degree..

IC ICM C22C038-44  
ICS C22C038-48

CC 55-3 (Ferrous Metals and Alloys)

ST martensite **stainless steel** mech property corrosion resistance heat treatment

IT Austempering  
Elongation, mechanical  
Hardness (mechanical)  
Tempering  
Yield strength

(of martensitic **stainless steel** having high strength and corrosion resistance)

IT Corrosion  
(resistance; of martensitic **stainless steel** having high strength and corrosion resistance)

IT 12597-68-1, **Stainless steel**, processes 429697-28-9  
429697-29-0 429697-30-3 429697-31-4 429697-32-5 429697-33-6  
429697-34-7 429697-35-8 **448895-47-4**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(martensitic **stainless steel** having high strength and corrosion resistance)

IT 12173-93-2, Martensite, occurrence

RL: OCU (Occurrence, unclassified); OCCU (Occurrence)

(phase; martensitic **stainless steel** having high strength and corrosion resistance)

IT **448895-47-4**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(martensitic **stainless steel** having high strength and corrosion resistance)

X L80 ANSWER 2 OF 21 HCA COPYRIGHT 2003 ACS

137:297891 Steel sheets surface-treated with alkali-soluble lubricating film exhibiting excellent formability and excellent film removal property being stable for a long time and independent of temperature for drying film. Yamaoka, Ikuro; Kanai, Hiroshi; Miyasaka, Akihiro; Mori, Yoichiro; Tawa, Tsutomu; Nishimura, Mitsuhiro; Kouda, Chikako (Nippon Steel Corporation, Japan; Mitsui Takeda Chemicals, Inc.). PCT Int. Appl. WO 2002078949 A1 20021010, 55 pp. DESIGNATED STATES: W: CA, KR, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR. (Japanese). CODEN: PIXXD2. APPLICATION: WO 2002-JP3232 20020329. PRIORITY: JP 2001-99311 20010330; JP 2001-99312 20010330; JP 2001-176681 20010612.

AB Steel sheets surface-treated with an alkali-sol. lubricating film, characterized in that one or both sides of the steel sheets are coated with an alkali-sol. lubricating film comprising, as main components, an aq. compn. contg. an alkali-sol. polyurethane having a polyether polyol as a skeleton and contg. a carboxyl group in the mol. thereof, and a lubricity-imparting agent in an amt. of 1-30% relative to the aq. compn. contg. an alkali-sol. polyurethane, in a film thickness of 0.5-10 .mu.m, and the film has a coeff. of elasticity of 0.5-20 GPa at 25.degree. after coating. The steel sheets exhibit excellent formability and excellent film removal property which is stable for a long time and independent of the temp. for drying the film. The steel sheets are used for fuel tank.

IC ICM B32B015-08

ICS B05D007-14; C23C022-00

CC 55-6 (Ferrous Metals and Alloys)

Section cross-reference(s): 38

IT 11109-52-7, SUS430 12597-68-1, **Stainless steel**,

processes 110218-32-1 112236-14-3 185750-12-3 403658-05-9

403658-06-0 403658-07-1 403658-08-2 403658-09-3 403658-10-6

470467-15-3 470467-16-4 **470467-17-5** 470467-18-6

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(**steel** sheets surface-treated with alkali-sol.

polyurethane-based lubricating film exhibiting excellent formability and film removal property for fuel tanks)

IT **470467-17-5**

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(steel sheets surface-treated with alkali-sol. polyurethane-based lubricating film exhibiting excellent formability and film removal property for fuel tanks)

X L80 ANSWER 3 OF 21 HCA COPYRIGHT 2003 ACS

137:172855 High-hardness steel with machinability for manufacture of cold-working dies. Abe, Yukio; Nakatsu, Hideshi; Tamura, Yasushi; Kada, Yoshihiro (Hitachi Metals, Ltd., Japan). U.S. Pat. Appl. Publ. US 2002112786 A1 20020822, 11 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-12503 20011212. PRIORITY: JP 2000-379222 20001213.

AB The high-hardness steel having good machinability for die manuf. contains

C .gtoreq.0.3 to <0.5, Si 0.7-2.0, and S 0.08-0.25%, and is suitable for machining at .gtoreq.50 m/min. The alloy steel optionally contains C .gtoreq.0.3 to <0.5, Si 0.7-2.0, Mn 0.1-2.0, S 0.08-0.25, and Cr 0.5-15.0 (esp. 4.0-6.0) with W and/or Mo total as (Mo + 0.5W) .ltoreq.3.5, V .ltoreq.4.0, and N .ltoreq.0.15%. The steel ingots are quench hardened and tempered for the Rockwell C-scale hardness .gtoreq.50. The typical die steel suitable for cutting at 150 m/min with a low tool wear contains C 0.39, Si 1.53, Mn 0.97, S 0.19, Cr 5.05, Mo 0.56, V 0.23, and N 0.0103%.

IC ICM C22C038-34

NCL 148326000

CC 55-3 (Ferrous Metals and Alloys)

IT 448183-71-9, uses 448183-73-1 448183-76-4 **448183-79-7**  
448183-81-1

RL: TEM (Technical or engineered material use); USES (Uses)

(alloying of; high-hardness tempered steel alloyed for machinability of cold-working dies)

IT **448183-79-7**

RL: TEM (Technical or engineered material use); USES (Uses)

(alloying of; high-hardness tempered steel alloyed for machinability of cold-working dies)

L80 ANSWER 4 OF 21 HCA COPYRIGHT 2003 ACS

137:172839 **Martensitic stainless steel** having high strength and corrosion resistance, and suitable for shafts or impellers. Jung, Jae-Young (Research Institute of Industrial Science & Technology, S. Korea). Brit. UK Pat. Appl. GB 2368849 A1 20020515, 21 pp. (English). CODEN: BAXXDU. APPLICATION: GB 2000-27771 20001114.

AB The martensitic **stainless steel** contains C <0.06, Si <2.5, Mn <2.5, Cr 10.0-19.0, Ni 1.0-6.0, W 0.5-6.0, Mo <3.5, Nb <0.5, V <0.5, Cu <3.0, and N 0.05-0.25%, optionally with Ti <0.8 and/or Ta <1.0%. The cast or forged **stainless steel** is typically finished by austenitizing at 800-1150.degree. and/or tempering at 350-575.degree.. The typical **stainless steel** having tensile yield strength of 106 MPa and elongation of 11.0% contains C 0.03, Si 0.25, Mn 0.4, Cr 16.0, Ni 2.0, W 3.0, Mo 0.5, Nb 0.1, V 0.2, Cu 0.5, and N 0.08%. Corrosion rate of the similar **stainless steel** is decreased by austenitization heat treatment after casting.

IC ICM C22C038-44

ICS B23K035-30; C22C038-46; C22C038-48; C22C038-50; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

ST martensitic **stainless steel** alloying strength shaft;  
cast martensitic **stainless steel** corrosion resistance

IT Impellers

Shafts

(**stainless steel** for; martensitic **stainless steel** having high strength for shafts or impellers)

IT Cast alloys

RL: TEM (Technical or engineered material use); USES (Uses)

(**stainless steel**; martensitic **stainless steel** having high strength for shafts or impellers)

IT **448895-46-3 448895-47-4 448895-48-5**

RL: TEM (Technical or engineered material use); USES (Uses)

(alloying of; martensitic **stainless steel** having high strength for shafts or impellers)

IT 429697-28-9 429697-29-0 429697-30-3 429697-31-4 429697-32-5  
429697-33-6 429697-34-7 429697-35-8

RL: TEM (Technical or engineered material use); USES (Uses)

(high-strength; martensitic **stainless steel** having high strength for shafts or impellers)

IT 448895-46-3 448895-47-4

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; martensitic **stainless steel** having  
high strength for shafts or impellers)

L80 ANSWER 5 OF 21 HCA COPYRIGHT 2003 ACS

137:128034 Chromium-containing steel bar having good corrosion resistance and reinforced concrete structure containing it. Ushiro, Takumi; Hirasawa, Junichiro; Ota, Hiroki; Furukimi, Osamu (Kawasaki Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002212682 A2 20020731, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-8380, 20010117.

AB The steel bar comprises C >0.001 and <0.3, N >0.001 and <0.3, Si >0.1 and <4.0, Mn >0.1 and <4.0, Cr >5.0 and <15.0, Co >0.01 and <1.0, Al <0.04, P <0.04, and S <0.03 wt.%. X

IC ICM C22C038-00

ICS C22C038-38; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

Section cross-reference(s): 58

IT	444105-78-6	444105-80-0	444105-82-2	444105-84-4	444105-86-6
	444105-87-7	444105-88-8	444105-89-9	444105-90-2	444105-91-3
	444105-92-4	444105-93-5	444105-94-6	444105-95-7	444105-96-8
	444105-97-9	444105-98-0	444105-99-1	444106-00-7	444106-01-8
	444106-02-9	444106-03-0	444106-04-1	444106-05-2	444106-06-3
	444106-07-4	444106-08-5	444106-09-6	444106-10-9	444106-11-0
	444106-12-1	444106-13-2	444106-14-3	444106-15-4	444106-16-5
	444106-17-6	444106-18-7	444106-19-8	444106-20-1	444106-21-2
	444106-22-3	444106-23-4	444106-24-5		

RL: TEM (Technical or engineered material use); USES (Uses)

(Cr-contg. steel bar having good corrosion resistance and reinforced concrete structure contg. it)

IT 444106-24-5

RL: TEM (Technical or engineered material use); USES (Uses)

(Cr-contg. steel bar having good corrosion resistance and reinforced concrete structure contg. it)

L80 ANSWER 6 OF 21 HCA COPYRIGHT 2003 ACS

136:404933 Martensitic **stainless steel** and manufacture thereof. Chung, Jae Young (Pihang Industrial Science Research Institute, S. Korea). Jpn. Kokai Tokkyo Koho JP 2002167651 A2 20020611, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-350000 20001116.

AB A martensitic **stainless steel** contains C .ltoreq.0.06, Si .ltoreq.2.5, Mn .ltoreq.2.5, Ni 1.0-6.0, Cr 10.0-19.0, W 0.5-6.0, Mo .ltoreq.3.5, Nb .ltoreq.0.8, V .ltoreq.0.8, Cu .ltoreq.3.0, and N 0.04-0.25%. The steel is manufd. by casting and homogenizing at 800-1150.degree. and/or tempering at 350-575.degree.. The steel is suitable for parts requiring high strength and corrosion resistance, for example, knives, shafts and impellers of boiler feed pumps.

IC ICM C22C038-00

ICS C21D006-00; C21D008-00; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

ST boiler feed pump martensitic **stainless steel** strength corrosion; homogenizing tempering martensitic **stainless steel**

IT Boilers

Feeding apparatus

Homogenization

Pumps

Tempering

(martensitic **stainless steel** and manuf. thereof for boiler feed pumps)



IT 429697-28-9 429697-29-0 429697-30-3 429697-31-4 429697-32-5  
429697-33-6 429697-34-7 429697-35-8 **429697-36-9**  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)

(martensitic **stainless steel** and manuf. thereof)

IT **429697-36-9**  
RL: PEP (Physical, engineering or chemical process); PYP (Physical  
process); TEM (Technical or engineered material use); PROC (Process); USES  
(Uses)  
(martensitic **stainless steel** and manuf. thereof)

L80 ANSWER 7 OF 21 HCA COPYRIGHT 2003 ACS

136:154328 Free-cutting **stainless steel**. Nakama, Kazuo;  
Isomoto, Tatsuo (Sanyo Special Steel Co., Ltd., Japan). Jpn. Kokai Tokkyo  
Koho JP 2002038241 A2 20020206, 7 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 2000-226743 20000727.

AB The **stainless steel** comprises C .ltoreq.0.50, Si  
0.05-2.00, Mn 0.05-1.00, S 0.05-0.50, Se 0.02-0.20, Te 0.01-0.10, and Cr  
10.00-30.00 wt.% balanced with Fe satisfying the following ratios: Mn/S  
.ltoreq.2, Se/S .gtoreq.0.2, and Te/S .gtoreq.0.04. Addn. of S, Se, and  
Te with good balance improves free-cutting property of the steel.

IC ICM C22C038-00

ICS C22C038-60

CC 55-3 (Ferrous Metals and Alloys)

ST free cutting **stainless steel** sulfur selenium tellurium  
balance

IT 395068-76-5 395068-77-6 395068-78-7 395068-79-8 395068-80-1  
395068-81-2 395068-82-3 395068-83-4 395068-84-5 395068-85-6  
395068-86-7 395068-87-8 395068-88-9 395068-89-0 395068-90-3  
395068-91-4 **395068-92-5** 395068-97-0

RL: TEM (Technical or engineered material use); USES (Uses)

(free-cutting **stainless steel**)

IT 7429-90-5, Aluminum, uses 7439-95-4, Magnesium, uses 7440-42-8, Boron,  
uses 7440-70-2, Calcium, uses

RL: MOA (Modifier or additive use); TEM (Technical or engineered material  
use); USES (Uses)

(microalloying element; free-cutting **stainless steel**  
)

IT **395068-92-5**

RL: TEM (Technical or engineered material use); USES (Uses)

(free-cutting **stainless steel**)

L80 ANSWER 8 OF 21 HCA COPYRIGHT 2003 ACS

135:347339 Steel having minute solidification structure. Kimura, Eiryu;  
Moroboshi, Takashi; Takahashi, Akihiko (Nippon Steel Corp., Japan). Jpn.  
Kokai Tokkyo Koho JP 2001303197 A2 20011031, 6 pp. (Japanese). CODEN:  
JKXXAF. APPLICATION: JP 2000-125321 20000426.

AB The title steel has inclusions having max. diam. 0.01-10.0 .mu.m and  
contg. nitrides of La, Ce, Pr, Nd, Sm, Eu and/or Gd at .gtoreq.1 of  
inclusions/mm<sup>2</sup> in any cross section. The steel has a compn. displaying  
austenite phase in the temp. region from the liquidus temp. to  
solidification temp. The steel contains C .ltoreq.0.08, Si .ltoreq.1.0,  
Mn 0.01-16.0, Cr 10-32, Ni .ltoreq.30, Al .ltoreq.0.05, and N  
.ltoreq.0.4%.

IC ICM C22C038-00

ICS C22C033-04; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

IT 113319-33-8, properties 371247-34-6 371247-35-7 **371247-36-8**  
371247-37-9

RL: PRP (Properties)  
(steel having minute solidification structure)

IT 371247-36-8

RL: PRP (Properties)  
(steel having minute solidification structure)

L80 ANSWER 9 OF 21 HCA COPYRIGHT 2003 ACS

135:64462 Ferritic **stainless steel** strip for press

formability with resistance to ridging defects. Hirata, Norimasa; Yokota, Takeshi; Kato, Yasushi; Ujiro, Takumi; Satoh, Susumu (Kawasaki Steel Corporation, Japan). Eur. Pat. Appl. EP 1113084 A1 20010704, 26 pp.

DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW.

APPLICATION: EP 2000-126068 20001129. PRIORITY: JP 1999-345449 19991203; JP 2000-47789 20000224.

AB The ferritic **stainless steel** resistant to the surface ridging defects contains C .ltoreq.0.1, Si .ltoreq.1.5, Mn .ltoreq.1.5, Cr 5-50, Ni .ltoreq.2.0, P .ltoreq.0.08, S .ltoreq.0.02, and N .ltoreq.0.1%, optionally with Nb .ltoreq.0.5, Ti .ltoreq.0.5, Al .ltoreq.0.2, V .ltoreq.0.3, Zr .ltoreq.0.3, Mo .ltoreq.2.5, Cu .ltoreq.2.5, W .ltoreq.2.0, rare-earth metals .ltoreq.0.1, B .ltoreq.0.05, Ca .ltoreq.0.02, and/or Mg .ltoreq.0.002%. The **stainless steel** ingot slab is hot rolled with 30% redn. and max. section-temp. difference <200.degree., annealed, and cold rolled, and the strip product is finished by annealing for .ltoreq.300 s at 700-1100.degree. for the av. grain size of 3-100 .mu.m with controlled crystallog. orientation. The typical **stainless steel** for the smooth strip 0.6 mm thick suitable for deep drawing contains C 0.0481, Si 0.55, Mn 0.759, Cr 16.83, Ni 0.3211, P 0.0218, S 0.0033, and N 0.0154%.

IC ICM C22C038-00

ICS C22C038-18; C21D008-02; C21D009-46; C21D008-04

CC 55-3 (Ferrous Metals and Alloys)

ST ferritic **stainless steel** strip surface ridging prevention

IT Crystal orientation

Metalworking

Surface structure

(of **stainless steel**; ferritic **stainless steel** alloyed for press formability with surface ridging resistance)

IT 345953-85-7 345953-86-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; ferritic **stainless steel** alloyed for press formability with surface ridging resistance)

IT 345953-87-9 345953-89-1 345953-91-5 345953-93-7 345953-94-8  
345953-96-0 345953-98-2

RL: PRP (Properties)

(ferritic **stainless steel** alloyed for press formability with surface ridging resistance)

IT 12597-68-1, **Stainless steel**, uses

RL: TEM (Technical or engineered material use); USES (Uses)  
(ferritic; alloying of ferritic **stainless steel** for press formability with ridging resistance)

IT 345953-86-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; ferritic **stainless steel** alloyed for press formability with surface ridging resistance)

L80 ANSWER 10 OF 21 HCA COPYRIGHT 2003 ACS

X 133:196542 High-hardness martensitic **stainless steel** with good corrosion resistance and cold processability. Koga, Takeshi; Shimizu, Tetsuya; Okabe, Michio (Daido Steel Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000239805 A2 20000905, 5 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-41946 19990219.

AB The steel contains C 0.10-0.40, Si <2.0, Mn <2.0, S <0.010, Cu 0.01-3.0, Ni >1.0 and .ltoreq.3.0, Cr 11.0-15.0, Mo + 0.5W = 0.01-1.0, N 0.13-0.18, Al <0.02, and O <0.010%. The steel is esp suitable for fasteners, bolts, etc.

IC ICM C22C038-00

ICS C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

ST hardness martensitic **stainless steel** corrosion bolt fastener

IT Bolts

Fasteners

(high-hardness martensitic **stainless steel** with good corrosion resistance and cold processability)

IT 289058-43-1 289058-44-2 289058-45-3 289058-46-4 289058-47-5  
289058-48-6 289058-49-7 289058-50-0 289058-51-1 289058-52-2  
289058-53-3 289058-54-4 289058-55-5 289058-56-6 289058-57-7  
289058-58-8 289058-59-9 **289058-60-2**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(high-hardness martensitic **stainless steel** with good corrosion resistance and cold processability)

IT **289058-60-2**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(high-hardness martensitic **stainless steel** with good corrosion resistance and cold processability)

OK L80 ANSWER 11 OF 21 HCA COPYRIGHT 2003 ACS

133:180848 Gas shielded arc welding wire for welding of high-Cr ferritic heat-resistant steels. Goto, Akinobu (Kobe Steel, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000233294 A2 20000829, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-34901 19990212.

AB The wires consist of C 0.02-0.15, Si 0.10-1.00, Mn 0.30-1.50, Cu 0.05-2.0, Ni 0.05-1.20, Cr 8-13, Mo 0.01-1.20, V 0.03-0.50, Nb 0.02-0.15, W 0.8-3.5, N 0.01-0.08, Ti 0.0008-0.09 wt.%, and balance Fe. Optionally, the wires may also contain .ltoreq.0.45 wt.% Co and 0.0005-0.008 wt.% B. The wires have high creep strength and std.-temp. toughness. The wires are esp. suitable for welding of steels used for boilers in thermal power plants.

IC ICM B23K035-30

ICS C22C038-00; C22C038-50; C22C038-54

CC 55-3 (Ferrous Metals and Alloys)

ST gas shielded arc welding wire; chromium ferritic steel welding wire; heat resistant steel welding wire; **iron** chromium tungsten **alloy** welding wire

IT Welding of metals

(gas metal-arc, electrodes; **iron**-chromium-tungsten **alloy** wires for gas shielded arc welding of high-chromium heat-resistant steels for)

IT Boilers

(thermal power plant; **iron**-chromium-tungsten **alloy** wires for gas shielded arc welding of high-chromium heat-resistant steels for)

IT 288574-32-3 288574-33-4 288574-34-5 288574-35-6 288574-36-7

RL: TEM (Technical or engineered material use); USES (Uses)

(**iron**-chromium-tungsten **alloy** wires for gas

shielded arc welding of high-chromium heat-resistant steels)

IT 288574-37-8  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**iron-chromium-tungsten alloy** wires for gas  
shielded arc welding of high-chromium heat-resistant steels for)

IT 7440-42-8, Boron, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(microalloying element; **iron-chromium-tungsten alloy**  
wires for gas shielded arc welding of high-chromium heat-resistant  
steels for)

IT 288574-37-8  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**iron-chromium-tungsten alloy** wires for gas  
shielded arc welding of high-chromium heat-resistant steels for)

L80 ANSWER 12 OF 21 HCA COPYRIGHT 2003 ACS

133:180846 High-strength, high-toughness **stainless steel**  
excellent in resistance to delayed fracture. Takano, Koji; Matsui,  
Takayoshi; Yoshimura, Kouichi (Nippon Steel Corporation, Japan). PCT Int.  
Appl. WO 2000049190 A1 20000824, 23 pp. DESIGNATED STATES: W: CA, CN,  
KR, RU, US; RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU,  
MC, NL, PT, SE. (Japanese). CODEN: PIXXD2. APPLICATION: WO 1999-JP7084  
19991216. PRIORITY: JP 1999-39529 19990218.

AB A high-strength, high-toughness **stainless steel**  
excellent in resistance to delayed fracture comprises 0.01 to 0.25% of C,  
0.05 to 1.0% of Si, 0.1 to 2.0% of Mn, 0.1 to 3.0% of Ni, 11.0 to 16.0% of  
Cr, 0.01 to 0.15% of N, 0.01 to 3.0% of Mo, or also comprises 0.001 to  
0.005% of B, or further comprises, in addn. to the above, one or more of  
0.05 to 0.5% of Ti, 0.05 to 0.5% of Nb and 0.05 to 0.5% of W. A ferrite  
content at the central portion of the material is .ltoreq.10%, and a  
surface layer portion having a depth of .gtoreq.1 .mu.m has a mixed  
structure of martensite and 3 to 30% of austenite. A stainless screw  
using the steel and methods for producing the **stainless**  
**steel** and the screw are also provided. The **stainless**  
**steel** can be used for producing an inexpensive **stainless**  
**steel** article which has high strength and excellent corrosion  
resistance and is improved esp. both in resistance to delayed fracture and  
in toughness, and is suitable for use as building materials, for example,  
a stainless screw.

IC ICM C22C038-18  
ICS C22C038-50; C22C038-54; C23C008-26

CC 55-3 (Ferrous Metals and Alloys)

ST **stainless steel** toughness strength delayed fracture  
screw

IT Fracture (materials)  
Screws  
Strength  
Toughness  
(high-strength, high-toughness **stainless steel**  
excellent in resistance to delayed fracture for)

IT 288378-73-4 288378-74-5 288378-75-6 288378-76-7 288378-77-8  
288378-78-9 288378-79-0 288378-80-3 288378-81-4 288378-82-5  
288378-83-6 288378-84-7 288378-85-8 288378-86-9 288378-87-0  
288378-88-1 **288378-89-2** 288378-90-5 288378-92-7  
RL: PRP (Properties); TEM (Technical or engineered material use); USES  
(Uses)  
(high-strength, high-toughness **stainless steel**  
excellent in resistance to delayed fracture for)

IT **288378-89-2**  
RL: PRP (Properties); TEM (Technical or engineered material use); USES

(Uses)

(high-strength, high-toughness **stainless steel**  
excellent in resistance to delayed fracture for)

L80 ANSWER 13 OF 21 HCA COPYRIGHT 2003 ACS

132:197299 **Iron alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steels. Sato, Norinobu; Goto, Akinobu (Kobe Steel, Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2000071093 A2 20000307, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-245324 19980831.

AB The title **Fe alloy** wire contains C 0.08-0.15, Si 0.05-0.30, Mn 0.20-0.70, Cu 0.10-1.20, Ni 0.20-1.20, Cr 9.0-13.0, Mo 0.30-0.70, V 0.10-0.50, Nb 0.02-0.07, W 1.0-2.0, and N >0.080 and .ltoreq.0.15 wt.%, where wt. ratio of W to Cu and N [W/(Cu + N)] is 1.0-6.0. The resulting welded parts had high creep strength and toughness.

IC ICM B23K035-30

ICS C22C038-00; C22C038-48

CC 55-3 (Ferrous Metals and Alloys)

ST **iron alloy** wire gas shielded arc welding; chromium ferritic heat resistance steel welding wire

IT Wires

(**Fe alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steel for forming welded part with creep strength and toughness)

IT Welding of metals

(gas metal-arc; **Fe alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steel for forming welded part with creep strength and toughness)

IT 99693-91-1, ASTM A387-Gr91

RL: MSC (Miscellaneous)

(**Fe alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steel for forming welded part with creep strength and toughness)

IT 259822-18-9 259822-19-0 259822-20-3 259822-21-4 259822-22-5

**259822-23-6**

RL: TEM (Technical or engineered material use); USES (Uses)

(**Fe alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steel for forming welded part with creep strength and toughness)

IT **259822-23-6**

RL: TEM (Technical or engineered material use); USES (Uses)

(**Fe alloy** wire for gas-shielded arc welding of high Cr ferritic heat resistance steel for forming welded part with creep strength and toughness)

L80 ANSWER 14 OF 21 HCA COPYRIGHT 2003 ACS

132:38677 Manufacture of heat-resistant high-chromium steels having excellent low-temperature toughness and creep strength. Hasegawa, Toshinaga; Tomita, Yukio-(Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11350031 A2 19991221-Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-163761 19980611.

AB Steel slabs contg. C 0.03-0.20, Si 0.01-1.0, Mn 0.10-2.0, Al 0.002-0.1, N 0.005-0.1, Cr 8-13, and Mo 0.5-2.0 and/or W 0.5-4.0 wt.% are successively treated by the following steps to give the title steels; (1) heating at 1000-1300.degree., hot rolling by 30-90% draft by beginning at 800-1250.degree. and finishing at .gtoreq.700.degree., (2) cooling to .ltoreq.300.degree., (3) reheating to 1150-1300.degree., (4) cooling to 700-1000.degree. by cooling rate .gtoreq.1.degree./min and retaining at the temp. region for 10-120 min, (5) cooling to .ltoreq.300.degree. by

cooling rate 0.1-50.degree./s, and (6) tempering at .gtoreq.600.degree. and <Acl transformation point. Alternatively, the manufg. steps involves (1)-(3), cooling to 850-900.degree. and further cooling to 700-800.degree. by cooling rate 0.1-2.degree./min, (5), and (6). The steel slabs may further contain (A) .gtoreq.1 selected from V 0.05-0.50, Nb 0.01-0.20, Ta 0.02-0.40, Ti 0.005-0.10, and Zr 0.005-0.10, (B) .gtoreq.1 selected from Ni 0.05-3.0, Cu 0.05-1.5, Co 0.05-5.0, and B 0.0005-0.01, and/or (C) .gtoreq.1 selected from Mg 0.0005-0.01, Ca 0.0005-0.01, and REM 0.005-0.10 wt.%. The manufg. process prevents generation of .delta.-ferrite.

IC ICM C21D008-02

ICS C22C038-00; C22C038-22; C22C038-54

CC 55-11 (Ferrous Metals and Alloys)

IT 252574-37-1 **252574-38-2**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of heat-resistant high-Cr steels having excellent low-temp. toughness and creep strength)

IT **252574-38-2**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of heat-resistant high-Cr steels having excellent low-temp. toughness and creep strength)

L80 ANSWER 15 OF 21 HCA COPYRIGHT 2003 ACS

130:285086 Ferritic heat resistant steels comprising lath martensite structure. Igarashi, Masaaki; Abe, Fujio; Muneki, Seiichi (Science and Technology Agency National Research Institute for Metals, Japan; Sumitomo Metal Industries, Ltd.). Jpn. Kokai Tokkyo Koho JP 11092881 A2 19990406 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-256482 19970922.

AB The steels comprise fine-grain martensite lath with width .ltoreq.0.5 .mu.m and length .ltoreq.5 .mu.m in random orientation with the length of neighboring lath with .ltoreq.2.degree. orientation is .ltoreq.5 .mu.m. Preferably, the steels contain C 0.06-0.18, Si 0-1.0, Mn 0-1.5, P .ltoreq.0.030, S .ltoreq.0.015, Cr 8.0-13.0, W 0-4.0, Mo 0-2.0, (W + 2Mo) .ltoreq.4.0, V 0.10-0.50, N 0-0.10, B 0-0.030, O .ltoreq.0.010, sol. Al 0-0.050, Co 0-5.0, Ni 0-0.50, and Cu 0-1.0 wt.%. Optionally, the steels also contain (A) 0-0.15 wt.% Nb and/or 0-0.30 wt.% Ta with satisfying 0.02 .ltoreq. (Nb + 1/2Ta) .ltoreq. 0.15 and/or (B) Ti 0-0.15, Zr 0-0.30, and/or Hf 0-0.3 wt.% with satisfying 0.02 .ltoreq. (Ti + 1/2Zr + 1/4Hf) .ltoreq. 0.15. The steels are manufd. by austenitization treatment at 1000-1250.degree., cooling to Al-500.degree., working to .gtoreq.15% draft by application of tension, compression, or twisting force, working for .gtoreq.1 time(s) to .gtoreq.15% draft by application of tension, compression, or twisting force other than the previous one for multi-step and multi-axis working, cooled to form martensite structure, and optionally tempered to form lath martensite structure. The steels have excellent thermal creep resistance.

IC ICM C22C038-00

ICS C21D008-02; C22C038-32; C22C038-54

CC 55-8 (Ferrous Metals and Alloys)

IT 222719-99-5 222720-00-5 222720-01-6 222720-02-7 222720-03-8  
222720-05-0 **222720-06-1**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of ferritic steels comprising lath martensite structure for thermal creep resistance)

IT **222720-06-1**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(manuf. of ferritic steels comprising lath martensite structure for thermal creep resistance)

L80 ANSWER 16 OF 21 HCA COPYRIGHT 2003 ACS

125:120487 Heat-resistant steel for steam turbine rotor shafts. Shiga, Masao; Harada, Yasuhiro; Nakamura, Shigeyoshi (Hitachi Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08120414 A2 19960514 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-250345 19941017.

AB The steel contains C 0.03-0.18, Si .ltoreq.0.10, Mn 0.05-1.5, Ni 0.05-1.0, Cr 9.0-13.0, Mo 0.05-0.50, W 2.0-3.0, V 0.05-0.30, Nb 0.01-0.20, Co 2.1-10.0, N 0.01-0.1, B 0.001-0.025, and Cu 0.1-1.5, Ti 0.01-0.2, Ta 0.02-0.40, Hf 0.001-0.02, Zr 0.01-0.2, and/or Ca 0.001-0.05%. Steam turbine rotor shafts are manufd. from the steel.

IC ICM C22C038-00

ICS C22C038-54; F01D025-00

CC 55-3 (Ferrous Metals and Alloys)

IT 179231-58-4 179231-60-8 179231-63-1 179231-65-3

179231-68-6 179231-72-2 179231-76-6 179231-79-9 179231-82-4

179231-85-7 179231-88-0 179231-91-5 179231-94-8 179231-97-1

179232-00-9 179232-03-2 179232-06-5 179232-08-7 179232-10-1

179232-12-3 179232-14-5 179232-16-7

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(rotor shaft in steam turbine from microalloyed heat-resistant steel)

IT 179231-58-4

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(rotor shaft in steam turbine from microalloyed heat-resistant steel)

L80 ANSWER 17 OF 21 HCA COPYRIGHT 2003 ACS

124:93880 Alloyed steels for tools and dies heat treated for controlled toughness using magnetization test. Nakai, Norihiko (Nippon Koshuha Steel Co., Ltd., Japan). U.S. US 5458703 A 19951017, 9 pp. Cont.-in-part of U.S. Ser. No. 813, 652, abandoned. (English). CODEN: USXXAM.

APPLICATION: US 1993-110925 19930824. PRIORITY: JP 1991-287364 19910622; JP 1991-287365 19910622; JP 1991-287366 19910622; US 1991-813652 19911227.

AB The tools and dies finished by quench hardening are manufd. from the alloy steels contg. C 0.15-1.5, Si .ltoreq.2.5, Mn .ltoreq.1.0, Cr 0.4-21, Mo .ltoreq.5.0, W .ltoreq.18, V .ltoreq.3.0, Co .ltoreq.21.0, Ni .ltoreq.18.0, Nb .ltoreq.1.25, Zr .ltoreq.1.25, Cu .ltoreq.2.0, Ti .ltoreq.2.5, Ta .ltoreq.1.25, B .ltoreq.0.010, N .ltoreq.0.50, Al .ltoreq.1.20, P .ltoreq.0.040, and S .ltoreq.0.040%. The quenched and tempered tool specimens are tested to det. their tempered hardness, magnetization (by Barkhausen noise), and Charpy impact toughness values, and to obtain a correlation of the toughness with the temp., hardness, and Barkhausen parameters in a math. model. The prodn. tools having the required toughness are obtained by adjusting the tempered hardness and/or the quench-hardening temp. based on calibration in the math. model. The tool specimens from Fe-0.45 C-5 Cr-1 Mo-0.5% V steel can be heat treated to Rockwell C-scale hardness of 43-51 by quenching from 990-1050.degree..

IC ICM C21D009-00

NCL 148503000

CC 55-5 (Ferrous Metals and Alloys)

Section cross-reference(s): 77

IT 172617-45-7

RL: TEM (Technical or engineered material use); USES (Uses)

(quench hardened; alloyed steels for tools and dies heat treated for controlled toughness using magnetization test)

## IT 172617-45-7

RL: TEM (Technical or engineered material use); USES (Uses)  
(quench hardened; alloyed steels for tools and dies heat treated for  
controlled toughness using magnetization test)

L80 ANSWER 18 OF 21 HCA COPYRIGHT 2003 ACS

123:62688 Welding wires for high-strength, corrosion-resistant ferritic steel.  
Ogawa, Kazuhiro; Hirata, Hiromasa; Sawaragi, Yoshiatsu; Takabe, Hideki;  
Matsumoto, Shigeru; Mizuta, Toshihiko (Sumitomo Metal Ind, Japan; Sumikin  
Welding Ind). Jpn. Kokai Tokkyo Koho JP 07080679 A2 19950328 Heisei, 8  
pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-249819 19930909.

AB The title welding wires contain C 0.03-0.15, Si 0.25-0.8, Mn 0.5-2, Cr  
10-13, Ni 0.1-1.5, Cu .ltoreq.3, Mo 0.01-0.4, W 1-2.5, Al 0.005-0.05, Nb  
0.02-0.2, V 0.05-0.3, N 0.005-0.07, S 0.001-0.008, P .ltoreq.0.02, O  
.ltoreq.0.01% with Cr+4Si-8.5.ltoreq.4Ni+Cu, and balance Fe. Optionally  
the welding wires further contain 0.0005-0.1% Mg or 0.0001-0.01% B. Welds  
having high strength and corrosion resistance at high temps. are obtained.

IC ICM B23K035-30

CC 55-9 (Ferrous Metals and Alloys)

ST **iron alloy** welding wire steel; ferritic steel welding  
wire

IT 164350-52-1 164350-53-2 164350-54-3 164350-55-4 164350-56-5  
164350-57-6 164350-58-7 **164907-82-8**

RL: TEM (Technical or engineered material use); USES (Uses)  
(Welding wires for high-strength and corrosion-resistant ferritic  
steel)

## IT 164907-82-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(Welding wires for high-strength and corrosion-resistant ferritic  
steel)

L80 ANSWER 19 OF 21 HCA COPYRIGHT 2003 ACS

122:111669 Ferritic **stainless steels** having good  
high-temperature ductility and strength. Takabe, Hideki; Sawaragi,  
Yoshiatsu (Sumitomo Metal Ind, Japan). Jpn. Kokai Tokkyo Koho JP 06293940  
A2 19941021 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP  
1993-81680 19930408.

AB The steels contain C 0.02-0.15, Si .ltoreq.0.5, Mn 0.1-1.5, P  
.ltoreq.0.025, S .ltoreq.0.015, O .ltoreq.0.005, Cr 8-14, V 0.1-0.3, Nb  
0.01-0.2, N 0.01-0.1, Al .ltoreq.0.05, B 0.001-0.02, Cu 0.05-3.0, Co  
1.0-5.0, and Mo 0.01-1.2 and/or W 0.8-3.5% with Cu/Co ratio .ltoreq.2.0.  
The steels may contain 0.1-1.5% Ni with Cu/(Co + Ni) .ltoreq.2.0.

IC ICM C22C038-00

ICS C22C038-32

CC 55-3 (Ferrous Metals and Alloys)

ST **stainless ferritic steel** ductility strength

IT 160853-78-1 160853-79-2 160853-80-5 160853-81-6 **160853-82-7**  
160853-83-8 160853-84-9 160853-85-0 160853-86-1 160853-87-2  
160853-88-3 160853-89-4 160853-90-7 160853-91-8 160853-92-9  
160853-93-0 160853-94-1 160935-80-8 **160935-81-9**

RL: TEM (Technical or engineered material use); USES (Uses)  
(ferritic having high-temp. ductility and strength)

## IT 160853-82-7 160935-81-9

RL: TEM (Technical or engineered material use); USES (Uses)  
(ferritic having high-temp. ductility and strength)

L80 ANSWER 20 OF 21 HCA COPYRIGHT 2003 ACS

120:35741 Welding wires for for heat-resistant ferritic chromium steel.  
Sakurai, Hideo; Ogawa, Tadao (Nippon Steel Corp, Japan). Jpn. Kokai  
Tokkyo Koho JP 05212582 A2 19930824 Heisei, 6 pp. (Japanese). CODEN:



JKXXAF. APPLICATION: JP 1992-22971 19920207.

AB The **Fe alloy** for welding wires contains C 0.03-0.12, Si .ltoreq.0.3, Mn 0.3-1.5, V 0.03-0.40, Nb 0.01-0.15, N 0.01-0.08, Cr 8-13, Ni 0.05-1.2, Mo 0.3-1.6, W 0.5-3.5, Co 1.0-5.0, and Cu 0.5-4.0%. The welds in ferritic steel show good toughness and crack resistance.

IC ICM B23K035-30

CC 55-9 (Ferrous Metals and Alloys)

ST welding wire ferritic chromium steel; **iron** chromium **alloy** wire welding steel

IT 11100-60-0, miscellaneous  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(welding of, **iron-alloy** wire for, with toughness and crack resistance)

IT 152024-95-8 152024-96-9 152024-97-0 152024-98-1 152024-99-2  
152025-00-8 152025-01-9 152025-02-0 152025-03-1  
RL: USES (Uses)  
(welding wire, for ferritic chromium steels)

IT 152025-00-8  
RL: USES (Uses)  
(welding wire, for ferritic chromium steels)

L80 ANSWER 21 OF 21 HCA COPYRIGHT 2003 ACS

77:91512 Structural diagram of low-carbon **stainless steels** applicable to metal that was cast and deposited during welding. Potak, Ya. M.; Sagalevich, E. A. (Moscow, USSR). Avtomaticheskaya Svarka, 25(5), 10-13 (Russian) 1972. CODEN: AVSVAU. ISSN: 0005-111X.

AB By using metallog. and magnetic analyses of 110 melts, a new structural diagram is developed for cast **stainless steels** with corrections for hard-surfaced and weld metals. The applicability regions for the diagram are: C and N 0.03-0.20, Cr 10-22, Ni .ltoreq.10, Si .ltoreq.1, Mn .ltoreq.1, Mo .ltoreq.2, Al .ltoreq.1.5, Nb .ltoreq.0.2, Ti .ltoreq.1, Cu .ltoreq.2.5, Co .ltoreq.8, V .ltoreq.0.5, and W .ltoreq.1%.

CC 55-7 (Ferrous Metals and Alloys)

ST structural diagram **stainless steel**; hard surfaced steel structure; weld steel structure

IT Welds  
Cast metals and alloys  
RL: USES (Uses)  
(**stainless steel**, structural diagram of low-carbon)

IT 37252-07-6  
RL: USES (Uses)  
(structural diagram of stainless, hard-facing and welding in relation to)

IT 37252-07-6  
RL: USES (Uses)  
(structural diagram of stainless, hard-facing and welding in relation to)

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L81 ANSWER 1 OF 12 HCA COPYRIGHT 2003 ACS

136:105568 **Ferritic** stainless steel for exhaust gas route component of gas turbine. Oku, Manabu; Fujimura, Yoshiyuki; Nakoshi, Toshiro (Nisshin Steel Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2002004011 A2 20020109, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-189004 20000623.

AB The **ferritic** stainless steel contains C .ltoreq.0.03, Si .ltoreq.1.0, Mn .ltoreq.1.5, Ni .ltoreq.0.6, Cr 11-19, Nb .ltoreq.0.8, Cu 1.0-3.0, N .ltoreq.0.03, and optionally .gtoreq.1 of Mo

.ltoreq.1.0, Ti .ltoreq.1.0, V .ltoreq.1.0, W .ltoreq.3.0, and Zr .ltoreq.3.0%. The high-temp. strength of the stainless steel does not decrease even when exposed to a high-temp. atm. for a long time, and its workability and low-temp. toughness after aging for a long time are excellent.

IC ICM C22C038-00

ICS C22C038-48; C22C038-50; F01D025-30; F02C007-00

CC 55-3 (Ferrous Metals and Alloys)

ST **ferritic** stainless steel gas turbine exhaust gas route component

IT Exhaust gases (engine)

Toughness

Turbines

(**ferritic** stainless steel for exhaust gas route component of gas turbine)

IT 388059-36-7 388059-37-8 388059-38-9 388059-39-0 388059-40-3

388059-41-4 388059-42-5 388059-43-6 388059-44-7 388059-45-8

388059-46-9 388059-47-0 388059-48-1 388059-49-2 388059-50-5

**388059-51-6**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(**ferritic** stainless steel for exhaust gas route component of gas turbine)

IT **388059-51-6**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(**ferritic** stainless steel for exhaust gas route component of gas turbine)

L81 ANSWER 2 OF 12 HCA COPYRIGHT 2003 ACS

135:374703 Heat-resisting **ferritic** stainless steel materials useful for gas turbine exhaust gas lines. Oku, Manabu; Fujimura, Yoshiyuki; Nakoshi, Toshiro (Nisshin Steel Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 2001316774 A2 20011116, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-136359 20000509.

AB The materials comprise C .ltoreq.0.03, Si .ltoreq.1.5, Mn .ltoreq.1.5, Ni .ltoreq.0.6, Cr 11-19, Nb .ltoreq.0.3, V 0.1-0.5, N 0.02-0.07 wt.%, and balance Fe, contain 0-30 vol.% martensitic phases, and show good high-temp. strength, low-temp. toughness, and workability. The materials may also contain Cu, Mo, Ti, W, and/or Zr at total amts. of .ltoreq.3 wt.%. The materials are useful for exhaust gas lines of high-temp. gas turbines in power plants, etc.

IC ICM C22C038-00

ICS C22C038-48; C22C038-50; F01D025-00; F01D025-30; F02C007-00

CC 55-3 (Ferrous Metals and Alloys)

Section cross-reference(s): 51, 59

ST heat resisting **ferritic** stainless steel strength; gas turbine line heat resisting stainless steel; exhaust line gas turbine stainless steel; power plant turbine **ferritic** stainless steel

IT Turbines

(heat-resisting **ferritic** stainless steel materials for gas turbine exhaust gas lines)

IT Power

(plants; heat-resisting **ferritic** stainless steel materials for gas turbine exhaust gas lines)

IT Exhaust gases (engine)

(turbine; heat-resisting **ferritic** stainless steel materials for gas turbine exhaust gas lines)

IT 374075-09-9 374075-10-2 374075-11-3 374075-12-4 374075-13-5

374075-14-6 374075-15-7 374075-16-8 374075-17-9 374075-18-0

374075-19-1 374075-20-4 374075-21-5 374075-22-6 **374075-23-7**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(heat-resisting **ferritic** stainless steel materials for gas turbine exhaust gas lines)

IT **374075-23-7**  
RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)  
(heat-resisting **ferritic** stainless steel materials for gas turbine exhaust gas lines)

L81 ANSWER 3 OF 12 HCA COPYRIGHT 2003 ACS

135:306752 Manufacture of **ferrite** stainless steel plate with good formability and ridging property. Kimura, Ken; Amafuji, Masayuki; Kikuchi, Masao (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001294991 A2 20011026, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-112010 20000413.

AB The steel comprises C 0.0005 -0.03, Si 0.01-1, Mn 0.01-1, P .ltoreq.0.04, S 0.0001-0.01, Cr 10-25, Ti 0.01-0.8, Al 0.005-0.1, N 0.0005-0.03, Mg 0.0005-0.01%, and Fe bal., where the TiN covered Mg inclusions (.ltoreq.0.05-5 .mu.m) exist in the steel at a d. of .gtoreq.3/mm2; and the size of the largest colony among the colonies {100}, {110}, and {111} is .ltoreq.2000 .mu.m in the rolling direction, .ltoreq.500 .mu.m in the cross direction, and .ltoreq.300 .mu.m in the thickness direction. The steel may further contain B 0.0005-0.005, Nb 0.05-0.5, V 0.05-0.5, Ta 0.05-0.5, W 0.05-0.5, Hf 0.05-0.5, Zr 0.05-0.5, Mo 0.1-2, Ni 0.1-2, Cu 0.1-2, Y 0.0002-0.005, La 0.0002-0.005, Ce 0.0002-0.005, Ca 0.0002-0.005, Sb 0.0002-0.005, Sn 0.001-0.1, and Ag 0.0005-0.3. The steel plate can be manufd. by hot rolling at 900-1200.degree. with rolling redn. .gtoreq.15% for .gtoreq.10 times.

IC ICM C22C038-00  
ICS C21D009-46; C22C038-28; C22C038-60

CC 55-3 (Ferrous Metals and Alloys)

IT Rolling (metals)  
(hot; in manuf. of **ferrite** stainless steel plate with good formability and ridging property)

IT Plates  
(manuf. of **ferrite** stainless steel plate with good formability and ridging property)

IT **Ferrites**  
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)  
(manuf. of **ferrite** stainless steel plate with good formability and ridging property)

IT 7439-95-4, Magnesium, occurrence 25583-20-4, Titanium nitride (TiN)  
RL: OCU (Occurrence, unclassified); OCCU (Occurrence)  
(inclusion; of **ferrite** stainless steel plate with good formability and ridging property)

IT 12597-68-1, Stainless steel, processes 169819-58-3 186957-36-8  
210101-54-5 366497-24-7 366497-29-2 366837-91-4 366837-92-5  
366837-93-6 366837-94-7 366837-95-8 366837-96-9 366837-97-0  
366837-98-1 366837-99-2 366838-00-8 366838-01-9 366838-02-0  
**366838-03-1**  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of **ferrite** stainless steel plate with good formability and ridging property)

IT **366838-03-1**  
RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of **ferrite** stainless steel plate with good formability and ridging property)

L81 ANSWER 4 OF 12 HCA COPYRIGHT 2003 ACS

135:64462 **Ferritic** stainless steel strip for press formability with resistance to ridging defects. Hirata, Norimasa; Yokota, Takeshi; Kato, Yasushi; Ujiro, Takumi; Satoh, Susumu (Kawasaki Steel Corporation, Japan). Eur. Pat. Appl. EP 1113084 A1 20010704, 26 pp. DESIGNATED STATES: R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO. (English). CODEN: EPXXDW. APPLICATION: EP 2000-126068 20001129. PRIORITY: JP 1999-345449 19991203; JP 2000-47789 20000224.

AB The **ferritic** stainless steel resistant to the surface ridging defects contains C .ltoreq.0.1, Si .ltoreq.1.5, Mn .ltoreq.1.5, Cr 5-50, Ni .ltoreq.2.0, P .ltoreq.0.08, S .ltoreq.0.02, and N .ltoreq.0.1%, optionally with Nb .ltoreq.0.5, Ti .ltoreq.0.5, Al .ltoreq.0.2, V .ltoreq.0.3, Zr .ltoreq.0.3, Mo .ltoreq.2.5, Cu .ltoreq.2.5, W .ltoreq.2.0, rare-earth metals .ltoreq.0.1, B .ltoreq.0.05, Ca .ltoreq.0.02, and/or Mg .ltoreq.0.002%. The stainless steel ingot slab is hot rolled with 30% redn. and max. section-temp. difference <200.degree., annealed, and cold rolled, and the strip product is finished by annealing for .ltoreq.300 s at 700-1100.degree. for the av. grain size of 3-100 .mu.m with controlled crystallog. orientation. The typical stainless steel for the smooth strip 0.6 mm thick suitable for deep drawing contains C 0.0481, Si 0.55, Mn 0.759, Cr 16.83, Ni 0.3211, P 0.0218, S 0.0033, and N 0.0154%.

IC ICM C22C038-00

ICS C22C038-18; C21D008-02; C21D009-46; C21D008-04

CC 55-3 (Ferrous Metals and Alloys)

ST **ferritic** stainless steel strip surface ridging prevention

IT Crystal orientation

Metalworking

Surface structure

(of stainless steel; **ferritic** stainless steel alloyed for press formability with surface ridging resistance)

IT 345953-85-7 **345953-86-8**

RL: TEM (Technical or engineered material use); USES (Uses)

(alloying of; **ferritic** stainless steel alloyed for press formability with surface ridging resistance)

IT 345953-87-9 345953-89-1 345953-91-5 345953-93-7 345953-94-8  
345953-96-0 345953-98-2

RL: PRP (Properties)

(**ferritic** stainless steel alloyed for press formability with surface ridging resistance)

IT 12597-68-1, Stainless steel, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(**ferritic**; alloying of **ferritic** stainless steel for press formability with ridging resistance)

IT **345953-86-8**

RL: TEM (Technical or engineered material use); USES (Uses)

(alloying of; **ferritic** stainless steel alloyed for press formability with surface ridging resistance)

L81 ANSWER 5 OF 12 HCA COPYRIGHT 2003 ACS

132:38677 Manufacture of heat-resistant high-chromium steels having excellent low-temperature toughness and creep strength. Hasegawa, Toshinaga; Tomita, Yukio (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 11350031 A2 19991221 Heisei, 12 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1998-163761 19980611.

AB Steel slabs contg. C 0.03-0.20, Si 0.01-1.0, Mn 0.10-2.0, Al 0.002-0.1, N 0.005-0.1, Cr 8-13, and Mo 0.5-2.0 and/or W 0.5-4.0 wt.% are successively treated by the following steps to give the title steels; (1) heating at 1000-1300.degree., hot rolling by 30-90% draft by

beginning at 800-1250.degree. and finishing at .gtoreq.700.degree., (2) cooling to .ltoreq.300.degree., (3) reheating to 1150-1300.degree., (4) cooling to 700-1000.degree. by cooling rate .gtoreq.1.degree./min and retaining at the temp. region for 10-120 min, (5) cooling to .ltoreq.300.degree. by cooling rate 0.1-50.degree./s, and (6) tempering at .gtoreq.600.degree. and <Acl transformation point. Alternatively, the manufg. steps involves (1)-(3), cooling to 850-900.degree. and further cooling to 700-800.degree. by cooling rate 0.1-2.degree./min, (5), and (6). The steel slabs may further contain (A) .gtoreq.1 selected from V 0.05-0.50, Nb 0.01-0.20, Ta 0.02-0.40, Ti 0.005-0.10, and Zr 0.005-0.10, (B) .gtoreq.1 selected from Ni 0.05-3.0, Cu 0.05-1.5, Co 0.05-5.0, and B 0.0005-0.01, and/or (C) .gtoreq.1 selected from Mg 0.0005-0.01, Ca 0.0005-0.01, and REM 0.005-0.10 wt.%. The manufg. process prevents generation of .delta.-ferrite.

IC ICM C21D008-02

ICS C22C038-00; C22C038-22; C22C038-54

CC 55-11 (Ferrous Metals and Alloys)

IT 252574-37-1 **252574-38-2**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(manuf. of heat-resistant high-Cr steels having excellent low-temp. toughness and creep strength)

IT **252574-38-2**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(manuf. of heat-resistant high-Cr steels having excellent low-temp. toughness and creep strength)

L81 ANSWER 6 OF 12 HCA COPYRIGHT 2003 ACS

130:285086 **Ferritic** heat resistant steels comprising lath martensite structure. Igarashi, Masaaki; Abe, Fujio; Muneki, Seiichi (Science and Technology Agency National Research Institute for Metals, Japan; Sumitomo Metal Industries, Ltd.). Jpn. Kokai Tokkyo Koho JP 11092881 A2 19990406 Heisei, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-256482 19970922.

AB The steels comprise fine-grain martensite lath with width .ltoreq.0.5 .mu.m and length .ltoreq.5 .mu.m in random orientation with the length of neighboring lath with .ltoreq.2.degree. orientation is .ltoreq.5 .mu.m. Preferably, the steels contain C 0.06-0.18, Si 0-1.0, Mn 0-1.5, P .ltoreq.0.030, S .ltoreq.0.015, Cr 8.0-13.0, W 0-4.0, Mo 0-2.0, (W + 2Mo) .ltoreq.4.0, V 0.10-0.50, N 0-0.10, B 0-0.030, O .ltoreq.0.010, sol. Al 0-0.050, Co 0-5.0, Ni 0-0.50, and Cu 0-1.0 wt.%. Optionally, the steels also contain (A) 0-0.15 wt.% Nb and/or 0-0.30 wt.% Ta with satisfying 0.02 .ltoreq. (Nb + 1/2Ta) .ltoreq. 0.15 and/or (B) Ti 0-0.15, Zr 0-0.30, and/or Hf 0-0.3 wt.% with satisfying 0.02 .ltoreq. (Ti + 1/2Zr + 1/4Hf) .ltoreq. 0.15. The steels are manufd. by austenitization treatment at 1000-1250.degree., cooling to Al-500.degree., working to .gtoreq.15% draft by application of tension, compression, or twisting force, working for .gtoreq.1 time(s) to .gtoreq.15% draft by application of tension, compression, or twisting force other than the previous one for multi-step and multi-axis working, cooled to form martensite structure, and optionally tempered to form lath martensite structure. The steels have excellent thermal creep resistance.

IC ICM C22C038-00

ICS C21D008-02; C22C038-32; C22C038-54

CC 55-8 (Ferrous Metals and Alloys)

ST lath martensite **ferritic** heat resistant steel; thermal creep resistance **ferritic** steel

IT Cooling

Heat treatment

## Metalworking

- (manuf. of **ferritic** steels comprising lath martensite structure for thermal creep resistance)
- IT 12173-93-2P, Martensite, preparation  
RL: PEP (Physical, engineering or chemical process); PNU (Preparation, unclassified); PRP (Properties); TEM (Technical or engineered material use); PREP (Preparation); PROC (Process); USES (Uses)  
(manuf. of **ferritic** steels comprising lath martensite structure for thermal creep resistance)
- IT 222719-99-5 222720-00-5 222720-01-6 222720-02-7 222720-03-8  
222720-05-0 **222720-06-1**  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of **ferritic** steels comprising lath martensite structure for thermal creep resistance)
- IT 7440-42-8, Boron, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(microalloying element; manuf. of **ferritic** steels comprising lath martensite structure for thermal creep resistance)
- IT **222720-06-1**  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(manuf. of **ferritic** steels comprising lath martensite structure for thermal creep resistance)

L81 ANSWER 7 OF 12 HCA COPYRIGHT 2003 ACS

122:86500 **Ferritic** stainless steel exhibiting good atmospheric corrosion resistance and crevice corrosion resistance.. Yazawa, Yoshihiro; Owada, Satoshi; Togashi, Fusao; Yoshioka, Keiichi; Satoh, Susumu C. O. Technical Res (Kawasaki Steel Corp., Japan). Eur. Pat. Appl. EP 625584 A1 19941123, 22 pp. DESIGNATED STATES: R: DE, FR, GB. (English). CODEN: EPXXDW. APPLICATION: EP 1994-107790 19940519. PRIORITY: JP 1993-117401 19930519.

AB The steel consists of C .ltoreq.0.05, Si .ltoreq.1.0, Cr 11-20, Mn .ltoreq.1.0, N .ltoreq.0.10, S .ltoreq.0.03, Al .ltoreq.0.5, P 0.04-0.2%, with Ca 5-50 ppm. The steel may also contain Mo .ltoreq.6, Ni .ltoreq.3, Co .ltoreq.3, and Cu, Ti, Nb, V, W, Zr, Ta each with .ltoreq.1%. The resulting stainless steel is suitable for building exterior finish work, elec. appliance parts, panels, or hot water tank bodies because of the good atm. and crevice corrosion resistance exhibited when P is added and Ca and Al amts. are adjusted.

IC ICM C22C038-18  
ICS C22C038-20; C22C038-22; C22C038-24; C22C038-26; C22C038-28;  
C22C038-30; C22C038-32

CC 55-10 (Ferrous Metals and Alloys)

ST **ferritic** stainless steel phosphorus; atm crevice corrosion resistance

IT Containers

(tanks, hot water tanks; **ferritic** stainless steel for)

IT 160537-20-2 160537-21-3 160537-22-4 160537-23-5 160537-24-6  
160537-25-7 160537-26-8 160537-27-9 160537-28-0 160537-29-1  
160537-30-4 160537-31-5 160537-32-6 160537-33-7 160537-34-8  
160537-35-9 160537-36-0 160537-37-1 160537-38-2 160537-39-3  
160537-40-6 160537-41-7 160537-42-8 160537-43-9 160537-44-0  
160537-45-1 160537-46-2 160537-47-3 160537-48-4 160537-49-5  
160573-90-0 160573-91-1 160573-92-2 160573-93-3 160573-94-4

**160573-95-5 160573-96-6**

RL: TEM (Technical or engineered material use); USES (Uses)  
(**ferritic** stainless steel exhibiting good atm. corrosion resistance and crevice corrosion resistance)

IT 160573-89-7  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**ferritic** stainless steel exhibiting good atm. corrosion resistance and crevice corrosion resistance.)

IT 12597-68-1, Stainless steel, uses  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**ferritic**, phosphorus added; **ferritic** stainless steel exhibiting good atm. corrosion resistance and crevice corrosion resistance)

IT **160573-95-5 160573-96-6**  
RL: TEM (Technical or engineered material use); USES (Uses)  
(**ferritic** stainless steel exhibiting good atm. corrosion resistance and crevice corrosion resistance)

L81 ANSWER 8 OF 12 HCA COPYRIGHT 2003 ACS

115:212541 **Ferritic** heat-resistant steels for high-toughness welds.  
Hasegawa, Hiroshi; Haga, Hirotsugu; Mizuhashi, Nobuo; Okami, Masahiro;  
Naoi, Hisashi (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP  
02294452 A2 19901205 Heisei, 14 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1989-113403 19890502.

AB The **ferritic** steels suitable for boiler tubes contain C  
0.01-0.30, Si 0.02-0.80, Mn 0.20-3.0, Cr 8.0-13.0, Ni 0.05-1.0, Mo  
0.005-1.0, W 0.50-3.0, V 0.05-0.50, Nb 0.02-0.12, B 0.0003-0.008, Cu  
0.10-5.0, Zr 0.0005-0.10, N 0.01-0.10, P .ltoreq.0.050, S  
.ltoreq.0.010, O .ltoreq.0.020, and optionally Ta 0.01-1.0, Hf 0.01-1.0,  
Co 0.01-0.1, and/or Ti 0.01-0.10% with (Mn + Ni + Co + Cu) .ltoreq.12%.  
The Cr steel having creep strength of typically 16.4-21.8 kg/mm2 is  
suitable for welds having cold (0.degree.) impact toughness of 15.1-24.8  
kg-m.

IC ICM C22C038-00  
ICS C22C038-54

CC 55-3 (Ferrous Metals and Alloys)

ST **ferrite** chromium steel boiler tube; weld toughness chromium  
steel tube

IT Pipes and Tubes  
(boiler, chromium steels for, high-toughness welds in **ferritic**  
)

IT	136792-42-2	136792-43-3	136792-44-4	136792-45-5	136792-46-6
	136792-47-7	136792-48-8	136792-49-9	136792-50-2	136792-51-3
	136792-52-4	136792-53-5	136792-54-6	136792-55-7	136792-56-8
	136792-64-8	136792-65-9	136792-66-0	136792-67-1	136792-68-2
	136792-69-3	136792-70-6	136792-71-7	136792-72-8	136792-73-9
	136792-74-0	136792-75-1	136792-76-2	136792-77-3	136792-78-4
	136792-79-5	136792-80-8	136792-81-9	136792-82-0	136792-83-1
	136792-84-2	136792-85-3	136792-86-4	136792-87-5	136792-88-6
	136820-31-0	136820-32-1	136820-33-2	136820-34-3	136820-35-4
	136820-36-5	136820-37-6	136820-38-7	136820-39-8	136820-40-1
	136820-41-2	136820-42-3	136820-43-4	136820-44-5	136820-45-6
	136820-46-7	136820-47-8	136820-48-9	136820-49-0	<b>136820-50-3</b>
	136820-51-4	136820-52-5	136820-53-6	136820-54-7	136820-55-8
	136820-56-9	136820-57-0	136820-58-1	136836-99-2	136837-00-8
	136837-01-9	136837-02-0	136837-03-1	136837-04-2	136837-05-3
	136837-06-4	136837-07-5	136837-08-6	136837-09-7	136837-10-0
	136837-11-1	136837-12-2	136837-13-3	136837-14-4	136837-15-5
	136837-16-6	136837-17-7	136837-18-8	136837-19-9	136837-20-2
	136837-21-3	136837-22-4	136837-23-5	136840-24-9	136840-25-0
	136840-26-1	136840-27-2	136840-28-3	136840-29-4	136840-30-7
	136840-31-8	136840-32-9	136840-33-0	136840-34-1	136840-35-2
	136840-36-3	136840-37-4	136840-38-5	136840-39-6	136840-40-9
	136840-41-0	136840-42-1	136840-43-2	136840-44-3	136840-45-4

136840-46-5 136840-47-6 136854-99-4 136855-00-0 136855-01-1  
136855-02-2 136855-03-3 136855-04-4 136855-05-5 136855-06-6  
136855-07-7 136855-08-8 136855-09-9 136855-10-2 136855-11-3  
136855-12-4 136855-13-5 136855-14-6 136855-15-7 136855-16-8  
136855-17-9 136855-18-0 136855-19-1 136855-20-4 136855-21-5  
136855-22-6 136855-23-7 136873-73-9 136873-74-0 136873-75-1  
136873-76-2 136873-77-3 136873-78-4 136873-79-5 136873-80-8  
136873-81-9 136873-82-0 136873-83-1 136873-84-2 136873-85-3  
136873-86-4 136873-87-5 136873-88-6 136900-23-7

RL: TEM (Technical or engineered material use); USES (Uses)

(**ferritic**, for boiler tubes, high-toughness welds in)

IT 136820-50-3

RL: TEM (Technical or engineered material use); USES (Uses)

(**ferritic**, for boiler tubes, high-toughness welds in)

L81 ANSWER 9 OF 12 HCA COPYRIGHT 2003 ACS

115:140048 Influence of nitriding on sputtering and radiation blistering of the surface of **ferritic**-martensitic steel under proton and helium(1+) ion bombardment. Guseva, M. I.; Ionova, E. S.; Isakov, M. G.; Shiryaev, P. P.; Neumoin, V. E.; Finaeva, N. N. (USSR). Poverkhnost (7), 140-4 (Russian) 1991. CODEN: PFKMDJ. ISSN: 0207-3528.

AB The radiation erosion of 18Kh12VMBFR with and without nitrided layer was studied after simultaneous irradiation with He+ at 30 keV and H+ at 10 keV at 400 and 600.degree.. Nitriding leads to formation of a hardened layer consisting of fine metal nitrides Cr2N, VN, and NbN which increase the Vickers hardness of the near-surface layer from 220 to 1200 kg/mm2. The sputtering coeff. of nitrided and initial steel by H+ and He+ ions is measured.

CC 55-6 (Ferrous Metals and Alloys)

ST **ferritic** martensitic steel nitriding sputtering; radiation blistering steel nitriding sputtering

IT 7727-37-9

RL: USES (Uses)

(nitridation, of duplex stainless steel, sputtering during simultaneous irradiation with helium and hydrogen ions in relation to)

IT 39294-27-4, 18Kh12VMBFR

RL: USES (Uses)

(sputtering of, during simultaneous irradiation with helium and hydrogen ions, effect of nitriding on)

IT 7727-37-9

RL: USES (Uses)

(nitridation, of duplex stainless steel, sputtering during simultaneous irradiation with helium and hydrogen ions in relation to)

IT 39294-27-4, 18Kh12VMBFR

RL: USES (Uses)

(sputtering of, during simultaneous irradiation with helium and hydrogen ions, effect of nitriding on)

L81 ANSWER 10 OF 12 HCA COPYRIGHT 2003 ACS

106:71181 Superplastic ferrous duplex-phase alloy suitable for hot working. Maehara, Yasuhiro; Tarutani, Yoshio (Sumitomo Metal Industries, Ltd., Japan). Brit. UK Pat. Appl. GB 2173816 A1 19861022, 20 pp. (English). CODEN: BAXXD. APPLICATION: GB 1986-7770 19860327. PRIORITY: JP 1985-64163 19850328; JP 1985-84087 19850419.

AB Duplex Fe alloy contains Si .gtoreq.0.5, Mn .gtoreq.1.7, N .gtoreq.0.01 in solid soln., Ni 0-5.0, Mo 0-6.0, Ti 0-0.5, Nb 0-0.5, W 0-1.0, Cr 0-20.0, Cu 0-1.0, Zr 0-0.5, and V 0-0.5%. Superplastic duplex stainless steel contains C .ltoreq.0.05, Mn 0-20, S .ltoreq.0.02, Ni 2.0-18, N 0.005-0.3, Si 0-5.0, P .ltoreq.0.005, Cr 10-35, Mo 0-6.0, W 0-5.0, Zr 0-3.0, Nb 0-3.0, V 0-5.0, and Cu 0-1.0%.



The amts. of Si and Mn are defined in terms of math. equiv. formula. The alloys contains **ferrite** and austenite phases at  $\gamma/(\alpha + \gamma)$  of 0.2-0.8, and exhibit superplasticity at 700-1200.degree.. Hot working is carried out at the strain rate 10<sup>-6</sup>-1/s. Thus, ingots of Fe alloy (contg. C 0.02, Si 7.0, Mn 7, P 0.015, S 0.001, Ni 2.5, Cr 12, Mo 2, N 0.02, and Ce 0.003 with Si equiv. 16.2 and Mn equiv. 12.2%) were forged, hot-rolled to 20 mm diam. rods, and hot-formed at strain rate 10<sup>-3</sup>/s. Elongation of 250% was obtained at max. stress of 1.5 kg/mm<sup>2</sup>. Specimens were heated to 1000.degree. and quenched in water for microanal. Elongation >1000% was obtained for  $\gamma/(\alpha + \gamma)$  ratio of .apprx.0.4.

IC ICM C22C038-00  
ICS C21D008-00

CC 55-3 (Ferrous Metals and Alloys)

IT 106554-74-9 106554-75-0 106554-76-1 106554-77-2 106554-78-3  
106554-79-4 106554-80-7 106554-81-8 106554-82-9 106554-83-0  
106554-84-1 106554-85-2 **106573-42-6**

RL: PRP (Properties)

(superplasticity of, duplex structure and hot strain rate for)

IT **106573-42-6**

RL: PRP (Properties)

(superplasticity of, duplex structure and hot strain rate for)

L81 ANSWER 11 OF 12 HCA COPYRIGHT 2003 ACS

94:195838 Effect of nitrogen on the change in properties of 12% chromium complex-alloy steel. Lanskaya, K. A.; Gorchakova, E. N.; Bychkov, B. V.; Doronin, V. M. (Tsentr. Nauchno-Issled. Inst. Chern. Metall., Moscow, USSR). Kachestvennye Stali i Splavy, 5, 73-5 (Russian) 1980. CODEN: KSSPD2.

AB Effect of 0.03-0.12% N on properties of steel 18Kh12VMBFR [ **39294-27-4**] was studied on elec.-furnace-melted samples. The steel was remelted by plasma arc in N under different partial pressures. Increasing the N content from 0.03 to 0.12% improved the hardenability and hardness of steel and decreased the content of free **ferrite**. Max. time to rupture at 650.degree. and 90-120 MPa was obsd. at .apprx.0.09% N. The impact strength of N-contg. steel was higher than that of N-free steel, but after 5000 h aging at 650.degree. the av. impact strength was .apprx.0.45 MN/m<sup>2</sup> at all N contents.

CC 55-8 (Ferrous Metals and Alloys)

IT **7727-37-9**, properties

RL: PRP (Properties)

(stainless steel contg., structure and strength in relation to)

IT **39294-27-4**

RL: PRP (Properties)

(structure and strength of, nitrogen effect on)

IT **7727-37-9**, properties

RL: PRP (Properties)

(stainless steel contg., structure and strength in relation to)

IT **39294-27-4**

RL: PRP (Properties)

(structure and strength of, nitrogen effect on)

L81 ANSWER 12 OF 12 HCA COPYRIGHT 2003 ACS

83:14134 Properties of 12% chromium steels in relation to alloying. Lanskaya, K. A.; Koreshkova, A. M. (Tsentr. Nauchno-Issled. Inst. Chern. Metall., Moscow, USSR). Metallovedenie i Termicheskaya Obrabotka Metallov (11), 26-9 (Russian) 1974. CODEN: MTOMAX. ISSN: 0026-0819.

AB The effects of various additives on the structure, phase compn., and properties of 15% Cr-Mo-W-V-Nb steels of type EI 993 are described. The heat resistance is improved most by alloying with Zr, N, and Al, as a

result of the formation of nitride phases while maintaining high ductility. With increasing amts. of W and Mo (<1.6%), the time to fatigue failure during long-term endurance testing is decreased insignificantly. With increasing amts. of Si to 2.0, Nb to 0.7, V to 0.6, Y to 0.4, and Ni to 1.3% the heat resistance considerably decreases as a result of increasing the **ferrite** amt., decreasing the crit. transformation temps., and decreasing the interat. bond in the cryst. lattice.

CC 55-8 (Ferrous Metals and Alloys)

IT **39294-27-4**

RL: USES (Uses)

(heat resistance of martensitic-**ferritic** stainless, alloying effect on fatigue life in relation to)

IT 7429-90-5, uses and miscellaneous 7439-98-7, uses and miscellaneous  
7440-02-0, uses and miscellaneous 7440-03-1, uses and miscellaneous  
7440-21-3, uses and miscellaneous 7440-33-7, uses and miscellaneous  
7440-62-2, uses and miscellaneous 7440-65-5, uses and miscellaneous  
7440-67-7, uses and miscellaneous **7727-37-9**, uses and miscellaneous

RL: USES (Uses)

(in stainless steels, heat resistance of martensitic-**ferritic**, fatigue life in relation to)

IT **39294-27-4**

RL: USES (Uses)

(heat resistance of martensitic-**ferritic** stainless, alloying effect on fatigue life in relation to)

IT **7727-37-9**, uses and miscellaneous

RL: USES (Uses)

(in stainless steels, heat resistance of martensitic-**ferritic**, fatigue life in relation to)

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L82 ANSWER 1 OF 13 HCA COPYRIGHT 2003 ACS

137:327838 Wear resistant tool alloy steel with increased toughness.

Bequiot, Jean; Viale, Dominique (Usinor, Fr.). PCT Int. Appl. WO 2002083966 A1 20021024, 19 pp. DESIGNATED STATES: W: AE, AG, AL, AM, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CN, CO, CR, CU, CZ, DM, DZ, EC, EE, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, RO, RU, SD, SG, SI, SK, SL, TJ, TM, TN, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM; RW: AT, BE, BF, BJ, CF, CG, CH, CI, CM, CY, DE, DK, ES, FI, FR, GA, GB, GR, IE, IT, LU, MC, ML, MR, NE, NL, PT, SE, SN, TD, TG, TR. (French). CODEN: PIXXD2. APPLICATION: WO 2002-FR1302 20020416. PRIORITY: FR 2001-5225 20010418.

AB The tool steel comprises C 0.8-1.5, Cr 5.0-14, Mn 0.2-3, Ni .ltoreq.5, V .ltoreq.1, Nb .ltoreq.0.1, Si+Al .ltoreq.2, Cu .ltoreq.1, S .ltoreq.0.3, Ca .ltoreq.0.1, Se .ltoreq.0.1, Te .ltoreq.0.1, (Mo+W/2) 1-4, (Ti+Zr/2) 0.06-0.15, N 0.004-0.02. In one embodiment, steel comprising Mo 2.5% and Ti 0.004% with no W and Zr has the fracture toughness of 10.5 J/cm2 and tensile strength of 47 J/cm2.

IC ICM C22C038-44

ICS C22C038-50; C22C038-42; C22C038-46; C22C038-60; C21C007-06

CC 55-3 (Ferrous Metals and Alloys)

IT **473437-44-4P** 473437-45-5P 473437-46-6P 473437-47-7P

RL: DEV (Device component use); IMF (Industrial manufacture); PRP (Properties); PREP (Preparation); USES (Uses)

(wear resistant tool alloy steel with increased toughness)

IT **473437-44-4P**

RL: DEV (Device component use); IMF (Industrial manufacture); PRP

(Properties); PREP (Preparation); USES (Uses)  
(wear resistant tool alloy steel with increased toughness)

L82 ANSWER 2 OF 13 HCA COPYRIGHT 2003 ACS

137:172855 High-hardness steel with machinability for manufacture of cold-working dies. Abe, Yukio; Nakatsu, Hideshi; Tamura, Yasushi; Kada, Yoshihiro (Hitachi Metals, Ltd., Japan). U.S. Pat. Appl. Publ. US 2002112786 A1 20020822, 11 pp. (English). CODEN: USXXCO. APPLICATION: US 2001-12503 20011212. PRIORITY: JP 2000-379222 20001213.

AB The high-hardness steel having good machinability for die manuf. contains C .gtoreq.0.3 to <0.5, Si 0.7-2.0, and S 0.08-0.25%, and is suitable for machining at .gtoreq.50 m/min. The alloy steel optionally contains C .gtoreq.0.3 to <0.5, Si 0.7-2.0, Mn 0.1-2.0, S 0.08-0.25, and Cr 0.5-15.0 (esp. 4.0-6.0) with W and/or Mo total as (Mo + 0.5W) .ltoreq.3.5, V .ltoreq.4.0, and N .ltoreq.0.15%. The steel ingots are quench hardened and tempered for the Rockwell C -scale hardness .gtoreq.50. The typical die steel suitable for cutting at 150 m/min with a low tool wear contains C 0.39, Si 1.53, Mn 0.97, S 0.19, Cr 5.05, Mo 0.56, V 0.23, and N 0.0103%.

IC ICM C22C038-34

NCL 148326000

CC 55-3 (Ferrous Metals and Alloys)

IT 448183-71-9, uses 448183-73-1 448183-76-4 **448183-79-7**  
448183-81-1

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; high-hardness tempered steel alloyed for machinability of cold-working dies)

IT **448183-79-7**

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; high-hardness tempered steel alloyed for machinability of cold-working dies)

L82 ANSWER 3 OF 13 HCA COPYRIGHT 2003 ACS

137:128034 Chromium-containing steel bar having good corrosion resistance and reinforced concrete structure containing it. Ushiro, Takumi; Hirasawa, Junichiro; Ota, Hiroki; Furukimi, Osamu (Kawasaki Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002212682 A2 20020731, 9 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2001-8380 20010117.

AB The steel bar comprises C >0.001 and <0.3, N >0.001 and <0.3, Si >0.1 and <4.0, Mn >0.1 and <4.0, Cr >5.0 and <15.0, Co >0.01 and <1.0, Al <0.04, P <0.04, and S <0.03 wt.%.

IC ICM C22C038-00

ICS C22C038-38; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

Section cross-reference(s): 58

IT 444105-78-6 444105-80-0 444105-82-2 444105-84-4 444105-86-6  
444105-87-7 444105-88-8 444105-89-9 444105-90-2 444105-91-3  
444105-92-4 444105-93-5 444105-94-6 444105-95-7 444105-96-8  
444105-97-9 444105-98-0 444105-99-1 444106-00-7 444106-01-8  
444106-02-9 444106-03-0 444106-04-1 444106-05-2 444106-06-3  
444106-07-4 444106-08-5 444106-09-6 444106-10-9 444106-11-0  
444106-12-1 444106-13-2 444106-14-3 444106-15-4 444106-16-5  
444106-17-6 444106-18-7 444106-19-8 444106-20-1 444106-21-2  
444106-22-3 444106-23-4 **444106-24-5**

RL: TEM (Technical or engineered material use); USES (Uses)  
(Cr-contg. steel bar having good corrosion resistance and reinforced concrete structure contg. it)

IT **444106-24-5**

RL: TEM (Technical or engineered material use); USES (Uses)  
(Cr-contg. steel bar having good corrosion resistance and reinforced

concrete structure contg. it)

L82 ANSWER 4 OF 13 HCA COPYRIGHT 2003 ACS

136:373168 Production of high-strength oil well steel pipe joints having superior corrosion resistance. Kimura, Mitsuo; Miyata, Yukio; Toyooka, Takaaki (Kawasaki Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2002137058 A2 20020514, 10 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-326699 20001026.

AB The oil well pipes are manufd. from martensitic stainless steel contg.

C .ltoreq.0.03, Si .ltoreq.0.70, Mn 0.3-2.0, P .ltoreq.0.03, S .ltoreq.0.005, Cr 10.5-15.0, Ni .ltoreq.7.0, Al .ltoreq.0.05, N .ltoreq.0.03, O .ltoreq.0.01, and optionally .gtoreq.1 metals of Nb .ltoreq.0.20, V .ltoreq.0.20, Mo 0.1-3.0, Cu .ltoreq.3.5, Ti .ltoreq.0.3, Zr .ltoreq.0.2, B 0.0005-0.01, and W .ltoreq.3.0%. The joint sections of the steel pipes has circumference welds contg. C+N .ltoreq.0.3, Si .ltoreq.1.0, Mn .ltoreq.2.5, Cr 10.5-24.0, Ni .ltoreq.8.0, Nb .ltoreq.0.20, V .ltoreq.0.20, and optionally .gtoreq.1 metals of Mo .ltoreq.3.5, Cu .ltoreq.3.5, Ti .ltoreq.0.3, Ti .ltoreq.0.3, Zr .ltoreq.0.2, Ca .ltoreq.0.01, B .ltoreq.0.01, W .ltoreq.3.5, and rare earth metals (REM) .ltoreq.0.1% under controlled welding conditions. The martensitic steel pipe joints show yield strength .gtoreq.551 MPa and high pitting resistance as well as weldability with toughness in the heat-affected zone.

IC ICM B23K009-028

ICS B23K009-23; F16L009-02; F16L013-02; C22C038-00; C22C038-58; B23K101-06

CC 56-9 (Nonferrous Metals and Alloys)

IT 423755-86-6 423755-87-7 423755-88-8 423755-89-9 423755-90-2  
423755-91-3 423755-92-4 **423755-93-5**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(prodn. of high-strength oil well steel pipe joints having superior corrosion resistance)

IT **423755-93-5**

RL: PEP (Physical, engineering or chemical process); TEM (Technical or engineered material use); PROC (Process); USES (Uses)  
(prodn. of high-strength oil well steel pipe joints having superior corrosion resistance)

L82 ANSWER 5 OF 13 HCA COPYRIGHT 2003 ACS

135:333769 High strength martensite stainless steel with good weldability for oil well tubes. Kimura, Mitsuo; Miyata, Yukio; Toyooka, Takaaki (Kawasaki Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001300730 A2 20011030, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 2000-114934 20000417.

AB The max. Hv of the weld of the tube made from the steel comprising

C .ltoreq.0.03, Si .ltoreq.0.7, Mn 0.3-2, P .ltoreq.0.03, S .ltoreq.0.005, Cr 10.5-15, Ni .ltoreq.7, Al .ltoreq.0.05, N .ltoreq.0.2, O .ltoreq.0.01%, Fe bal. is <380; and the av. Hv difference between the base metal and the heat-affected zone of the steel is <100. The steel may further contain Nb .ltoreq.0.2, V .ltoreq.0.2, Mo 0.1-3, Cu .ltoreq.3.5, Ti .ltoreq.0.3, Zr .ltoreq.0.2, W .ltoreq.3, B .ltoreq.0.0005-0.01, and Ca 0.0005-0.01%. The title steel has high corrosion resistance and low temp. toughness.

IC ICM B23K009-23

ICS B23K009-00; B23K009-028; C22C038-00; C22C038-40; C22C038-58; B23K101-06; B23K103-04

CC 55-9 (Ferrous Metals and Alloys)

IT 370085-04-4 370085-05-5 370085-06-6 370085-07-7 370085-08-8  
370085-09-9 370085-10-2 **370085-11-3**

RL: TEM (Technical or engineered material use); USES (Uses)

(stainless steel; high strength martensite stainless steel with good weldability for oil well tubes)

IT **370085-11-3**

RL: TEM (Technical or engineered material use); USES (Uses)

(stainless steel; high strength martensite stainless steel with good weldability for oil well tubes)

L82 ANSWER 6 OF 13 HCA COPYRIGHT 2003 ACS

135:49243 Ferrous alloys having excellent corrosion resistance at machined and processes parts. Kato, Kenji; Nishimura, Kazumi; Waki, Ryosuke (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 2001164341 A2 20010619, 16 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1999-351248 19991210.

AB The alloys consist of C .ltoreq.0.02, Si 0.01-3, Mn 0.1-3, Cr 10-30, Al 0.1-10, Mg 0.0003-0.1, P .ltoreq.0.03, S .ltoreq.0.01, and N .ltoreq.0.02 wt.%, and balance Fe and have 0.5-500 .mu.m-thick sacrificial surface metal layer, i.e. having lower elec. potential in aq. solns. than the substrate alloys. The surface metal layer is formed on at least the alloy surface which is exposed during use. Optionally, the substrate alloys may also contain Cu 0.05-5, Mo 0.05-10, Sb 0.01-0.5, Ni 0.01-10, W 0.05-3, rare earth metals 0.001-0.1, Ca 0.0001-0.05, and/or Nb, V, Ti, Zr, Ta, and/or Hf 0.01-1 wt.% under satisfaction of Nb/93 + V/51 + Ti/48 + Zr/91 + Ta/181 + Hf/179 .gtoreq. 0.8(C/12 + N /14). Preferably, the coatings formed on the alloy surfaces are Al, Al base alloys, Zn, Zn base alloys, Zn-(0.1-55) wt.% Al alloy, Mn, Mn base alloy, or alloys contg. 0.05-15 wt.% Mg, Si, and/or In. The coated alloys have excellent corrosion resistance under various conditions, e.g. against seawater, tap water drinking water, soil, concrete, atm., etc.

IC ICM C22C038-00

ICS C22C038-38; C22C038-58

CC 55-6 (Ferrous Metals and Alloys)

Section cross-reference(s): 56

IT 252764-22-0	252867-34-8	252867-36-0	252867-37-1	252867-38-2
252867-39-3	252867-40-6	252867-41-7	252867-42-8	252867-43-9
252867-44-0	252867-45-1	252867-46-2	252867-48-4	252867-49-5
252867-50-8	252867-51-9	252867-52-0	252867-53-1	252867-54-2
252867-55-3	252867-56-4	252867-57-5	252867-58-6	252867-59-7
252867-60-0	252867-61-1	252867-64-4	252867-65-5	252867-66-6
252867-67-7	252867-68-8	252867-69-9	252867-70-2	252867-71-3
252867-72-4	252867-73-5	252867-74-6	252867-75-7	252867-77-9
252867-78-0	252867-79-1	252867-80-4	252867-81-5	252867-83-7
252867-84-8	252867-85-9	252867-88-2	252867-89-3	252867-90-6
252867-91-7	252867-92-8	252867-94-0	252867-96-2	252867-97-3
252867-98-4	252867-99-5	252868-00-1	252868-01-2	252868-03-4
252868-04-5	252868-05-6	252868-06-7	252868-07-8	252868-08-9
252868-09-0	252868-10-3	252868-12-5	252868-15-8	252868-16-9
252868-17-0	252876-44-1	252876-49-6	252876-59-8	344788-81-4
344788-88-1	344788-96-1	344789-13-5	344789-16-8	344789-21-5

**344789-24-8**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(substrate; Fe-Al-Cr alloys with sacrificial coatings for excellent corrosion resistance under various conditions)

IT **344789-24-8**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(substrate; Fe-Al-Cr alloys with sacrificial coatings for excellent corrosion resistance under various conditions)

L82 ANSWER 7 OF 13 HCA COPYRIGHT 2003 ACS

134:118867 Manufacture of Cr stainless steels without surface defects. Abe,

Masayuki; Takahashi, Akihiko; Yamaji, Kiyoshi (Nippon Steel Corp., Japan).

Jpn. Kokai Tokkyo Koho JP 2001026825 A2 20010130, 7 pp. (Japanese).

CODEN: JKXXAF. APPLICATION: JP 1999-199597 19990713.

AB Cr stainless steels contg. C .ltoreq.0.08, Si .ltoreq.2.0, Mn .ltoreq.2, P .ltoreq.0.04, S .ltoreq.0.01, Cr 7-16, N .ltoreq.0.05 wt.%, and balance Fe are hot rolled at .gtoreq.1000.degree. and .ltoreq.Th to give the Cr stainless steels, where Th(.degree.) =  $2435 - 130(\text{Creq} - \text{Nieq})$ ,  $\text{Creq} = \text{Cr} + 1.5\text{Si} + \text{Mo} + 0.5(\text{Sn} + \text{Al} + \text{Ti} + \text{Nb} + \text{Zr} + \text{V} + \text{W} + \text{Ta}) + 30\text{B}$ , and  $\text{Nieq} = \text{Ni} + 0.5\text{Mn} + 0.5\text{Cu} + 0.5\text{Co} + 30\text{C} + 30\text{N}$ . The stainless steels may also contain (A) Al .ltoreq.1, (B) Mo .ltoreq.2 and/or Cu .ltoreq.2, (C) Ni .ltoreq.2, Co .ltoreq.1, and/or Sn .ltoreq.1, (D) Ti .ltoreq.1, Nb .ltoreq.1, Zr .ltoreq.1, V .ltoreq.1, W .ltoreq.1, and/or Ta .ltoreq.1, (E) Mg 0.0005-0.01 and/or Ca 0.0005-0.01, and/or (F) B .ltoreq.0.004 wt.%. The hot rolling process prevents surface cracks or scabs of Cr stainless steels.

IC ICM C21D009-00

ICS B21B003-02; C21D008-02; C21D009-46; C22C038-00; C22C038-38; C22C038-58

CC 55-11 (Ferrous Metals and Alloys)

IT 85783-68-2 321557-87-3 321557-88-4 321557-89-5 321557-90-8

321557-91-9 321557-92-0 321557-93-1 321557-94-2 321557-95-3

321557-96-4 321557-97-5 321557-98-6 321557-99-7 321558-00-3

321558-01-4 **321558-02-5**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses) (hot rolling temp. control for Cr stainless steels without surface defects)

IT **321558-02-5**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses) (hot rolling temp. control for Cr stainless steels without surface defects)

L82 ANSWER 8 OF 13 HCA COPYRIGHT 2003 ACS

130:270162 Welded high-chromium steel pipes with resistance to sulfide corrosion cracking and high tenacity at welded parts. Doi, Masamitsu; Endo, Shigeru (Nippon Kokan Co., Ltd., Japan). Jpn. Kokai Tokkyo Koho JP 11080881 A2 19990326 Heisei, 8 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1997-240720 19970905.

AB The title pipes are (a) steel pipes contg. C .ltoreq.0.03, Si .ltoreq.1.0, Mn .ltoreq.5.0, P .ltoreq.0.03, S .ltoreq.0.008, Cr 10-14, and Ni 0.5-6.0 wt.%, and .ltoreq.300 ppm N, and having M .ltoreq.14.0 ( $M = \text{Cr} + 1.3\text{Mo} - \text{Ni}$ ) that are seam-welded with (b) steels contg. C .ltoreq.0.03, Si .ltoreq.1.0, Mn .ltoreq.5.0, P .ltoreq.0.03, S .ltoreq.0.008, Cr 10-20, Ni 3.5-12 wt.%, and .ltoreq.400 ppm N and .ltoreq.500 ppm O and having P 15-25 [ $P = \text{Ni} + 30\text{C} + 0.5\text{Mn} + 0.8(\text{Cr} + \text{Mo} + 1.5\text{Si} + 0.5\text{Nb})$ ] and Q .gtoreq.-5.8 [ $Q = \text{Ni} + 30\text{C} + 0.5\text{Mn} - 0.72(\text{Cr} + \text{Mo} + 1.5\text{Si} + 0.5\text{Nb})$ ]. The pipes are useful for transporting CO<sub>2</sub>(g), H sulfide-contg. gases, or petroleum.

IC ICM C22C038-00

ICS B21C037-08; C22C038-58

CC 55-3 (Ferrous Metals and Alloys)

IT 222024-10-4 222024-11-5 222024-12-6 222024-13-7 222024-14-8

222024-15-9 222024-16-0 222024-18-2 222024-19-3 **222024-34-2**

RL: PRP (Properties); TEM (Technical or engineered material use); USES (Uses)

(pipe; welded high chromium steel pipes with resistance to sulfide corrosion cracking and tenacity)

IT **222024-34-2**

RL: PRP (Properties); TEM (Technical or engineered material use); USES

(Uses)

(pipe; welded high chromium steel pipes with resistance to sulfide corrosion cracking and tenacity)

L82 ANSWER 9 OF 13 HCA COPYRIGHT 2003 ACS

125:120487 Heat-resistant steel for steam turbine rotor shafts. Shiga, Masao; Harada, Yasuhiro; Nakamura, Shigeyoshi (Hitachi Ltd, Japan). Jpn. Kokai Tokkyo Koho JP 08120414 A2 19960514 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1994-250345 19941017.

AB The steel contains C 0.03-0.18, Si .ltoreq.0.10, Mn 0.05-1.5, Ni 0.05-1.0, Cr 9.0-13.0, Mo 0.05-0.50, W 2.0-3.0, V 0.05-0.30, Nb 0.01-0.20, Co 2.1-10.0, N 0.01-0.1, B 0.001-0.025, and Cu 0.1-1.5, Ti 0.01-0.2, Ta 0.02-0.40, Hf 0.001-0.02, Zr 0.01-0.2, and/or Ca 0.001-0.05%. Steam turbine rotor shafts are manufd. from the steel.

IC ICM C22C038-00

ICS C22C038-54; F01D025-00

CC 55-3 (Ferrous Metals and Alloys)

IT **179231-58-4** 179231-60-8 179231-63-1 179231-65-3

179231-68-6 179231-72-2 179231-76-6 179231-79-9 179231-82-4

179231-85-7 179231-88-0 179231-91-5 179231-94-8 179231-97-1

179232-00-9 179232-03-2 179232-06-5 179232-08-7 179232-10-1

179232-12-3 179232-14-5 179232-16-7

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(rotor shaft in steam turbine from microalloyed heat-resistant steel)

IT **179231-58-4**

RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); TEM (Technical or engineered material use); PROC (Process); USES (Uses)

(rotor shaft in steam turbine from microalloyed heat-resistant steel)

L82 ANSWER 10 OF 13 HCA COPYRIGHT 2003 ACS

124:93880 Alloyed steels for tools and dies heat treated for controlled toughness using magnetization test. Nakai, Norihiko (Nippon Koshuha Steel Co., Ltd., Japan). U.S. US 5458703 A 19951017, 9 pp. Cont.-in-part of U.S. Ser. No. 813, 652, abandoned. (English). CODEN: USXXAM. APPLICATION: US 1993-110925 19930824. PRIORITY: JP 1991-287364 19910622; JP 1991-287365 19910622; JP 1991-287366 19910622; US 1991-813652 19911227.

AB The tools and dies finished by quench hardening are manufd. from the alloy steels contg. C 0.15-1.5, Si .ltoreq.2.5, Mn .ltoreq.1.0, Cr 0.4-21, Mo .ltoreq.5.0, W .ltoreq.18, V .ltoreq.3.0, Co .ltoreq.21.0, Ni .ltoreq.18.0, Nb .ltoreq.1.25, Zr .ltoreq.1.25, Cu .ltoreq.2.0, Ti .ltoreq.2.5, Ta .ltoreq.1.25, B .ltoreq.0.010, N .ltoreq.0.50, Al .ltoreq.1.20, P .ltoreq.0.040, and S .ltoreq.0.040%. The quenched and tempered tool specimens are tested to det. their tempered hardness, magnetization (by Barkhausen noise), and Charpy impact toughness values, and to obtain a correlation of the toughness with the temp., hardness, and Barkhausen parameters in a math. model. The prodn. tools having the required toughness are obtained by adjusting the tempered hardness and/or the quench-hardening temp. based on calibration in the math. model. The tool specimens from Fe-0.45 C-5 Cr-1 Mo-0.5% V steel can be heat treated to Rockwell C-scale hardness of 43-51 by quenching from 990-1050.degree..

IC ICM C21D009-00

NCL 148503000

CC 55-5 (Ferrous Metals and Alloys)

Section cross-reference(s): 77

IT **172617-45-7**

RL: TEM (Technical or engineered material use); USES (Uses)

(quench hardened; alloyed steels for tools and dies heat treated for controlled toughness using magnetization test)

IT **172617-45-7**  
RL: TEM (Technical or engineered material use); USES (Uses)  
(quench hardened; alloyed steels for tools and dies heat treated for controlled toughness using magnetization test)

L82 ANSWER 11 OF 13 HCA COPYRIGHT 2003 ACS

121:305533 Corrosion-resistant stainless steels for diesel engine exhaust valves. Sato, Eiji; Tano, Kazuhiro; Arakawa, Motohiko (Shinnippon Seitetsu Kk, Japan). Jpn. Kokai Tokkyo Koho JP 06228710 A2 19940816 Heisei, 7 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1993-13875 19930129.

AB The steels contain Cr 10-25, C .ltoreq.0.02, Si .ltoreq.0.02, Mn 0.05-1.5, P .ltoreq.0.025, S .ltoreq.0.010, N .ltoreq.0.015, Al 0.005-0.1, Mo 0.05-1.0, and Cu .ltoreq.0.2%. Optionally, the steels contain (1) .gtoreq.1 of 5(C + N) .ltoreq.0.5Nb and 10(C + N) .ltoreq.0.5Ti; (2) Ni 0.1-1.0, W 0.05-0.5, Zr 0.05-0.5, and/or V 0.05-0.5%; and/or (3) 0.001-0.03 Ca and/or 0.001-0.03% Ce. The stainless steels are corrosion resistant under diesel exhaust gas conditions.

IC ICM C22C038-00  
ICS C22C038-22; F01N007-16

CC 55-3 (Ferrous Metals and Alloys)

IT 159356-58-8 159356-59-9 159356-60-2 159356-61-3 159356-62-4  
159356-63-5 159356-64-6 159356-65-7 159356-66-8 159356-67-9  
159356-68-0 159356-69-1 159356-70-4 159356-71-5 159356-72-6  
159356-73-7 159356-74-8 159356-75-9 159356-76-0 159356-77-1  
159356-78-2 159356-79-3 159356-80-6 159356-81-7 **159366-58-2**  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(corrosion-resistant for diesel engine exhaust valves)

IT **159366-58-2**  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(corrosion-resistant for diesel engine exhaust valves)

L82 ANSWER 12 OF 13 HCA COPYRIGHT 2003 ACS

118:107185 Stainless steels for high-strength pipelines with good weldability. Myasaka, Akihiro (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP 04268044 A2 19920924 Heisei, 6 pp. (Japanese). CODEN: JKXXAF. APPLICATION: JP 1991-28959 19910222.

AB The steels contain C <0.02, Si .ltoreq.1, Mn .ltoreq.2, Cr 11-14, Co 1.1-4.0, Al 0.005-0.2%, and N content controlled at .ltoreq.0.015%. The P and S contents are controlled at .ltoreq.0.025% and .ltoreq.0.010%. The steels optionally, contain Ni .ltoreq.4, Cu .ltoreq.3, Mo .ltoreq.2, W .ltoreq.4, V .ltoreq.0.5, Ti .ltoreq.0.2, Nb .ltoreq.0.5, Zr .ltoreq.0.2, Ta .ltoreq.0.2, Hf .ltoreq.0.2, Ca .ltoreq.0.008, and/or rare earth metals .ltoreq.0.02%. The steels are corrosion resistant to CO2.

IC ICM C22C038-00  
ICS C22C038-30

CC 55-3 (Ferrous Metals and Alloys)

IT **146179-87-5** 146180-03-2 146180-04-3 146180-05-4  
146180-06-5 146180-38-3 146180-39-4 146180-40-7 146180-41-8  
146180-42-9 146180-43-0 146180-44-1 146180-45-2 146180-46-3  
146180-47-4 146180-48-5  
RL: USES (Uses)  
(for pipelines, corrosion-resistant and weldable)

IT **146179-87-5**  
RL: USES (Uses)  
(for pipelines, corrosion-resistant and weldable)



L82 ANSWER 13 OF 13 HCA COPYRIGHT 2003 ACS

118:107184 Stainless steels for high-strength pipelines with good weldability.  
Myasaka, Akihiro (Nippon Steel Corp., Japan). Jpn. Kokai Tokkyo Koho JP  
04268043 A2 19920924 Heisei, 11 pp. (Japanese). CODEN: JKXXAF.  
APPLICATION: JP 1991-28958 19910222.

AB The steels contain C 0.02-0.08, Si .ltoreq.1, Mn .ltoreq.2, Cr  
11-14, Co 1.1-4.0, Al 0.005-0.2%, and N controlled at  
.ltoreq.0.015%. The P and S contents are controlled at .ltoreq.0.025% and  
.ltoreq.0.010%. The steels optionally contain Ni .ltoreq.4, Cu .ltoreq.3,  
Mo .ltoreq.2, W .ltoreq.4, V .ltoreq.0.5, Ti .ltoreq.0.2, Nb .ltoreq.0.5,  
Ta .ltoreq.0.2, Zr .ltoreq.0.2, Hf .ltoreq.0.2, Ca .ltoreq.0.008, and/or  
rare earth metals .ltoreq.0.02%. The steels are corrosion resistant to  
CO<sub>2</sub>.

IC ICM C22C038-00  
ICS C22C038-30

CC 55-3 (Ferrous Metals and Alloys)

IT 146179-79-5 146179-80-8 146179-81-9 146179-82-0 146179-83-1  
146179-84-2 146179-85-3 146179-86-4 **146179-87-5**  
146180-07-6 146180-08-7 146180-09-8 146180-10-1 146180-11-2  
146180-12-3 146180-13-4 146180-14-5 146180-15-6 146180-16-7  
146180-17-8 146180-18-9 146180-19-0 146180-20-3 146180-21-4  
146180-22-5 146180-23-6 146180-24-7

RL: USES (Uses)

(for pipelines, corrosion-resistant and weldable)

IT **146179-87-5**

RL: USES (Uses)

(for pipelines, corrosion-resistant and weldable)

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L32 ANSWER 1 OF 7 REGISTRY COPYRIGHT 2003 ACS

RN 448183-79-7 REGISTRY

CN Iron alloy, base, Fe 55-98, Cr 0.5-15, Co 0-5, Ni 0-4, V 0-4, Mo 0-3.5, W  
0-3.5, Si 0.7-2, Mn 0.1-2, Cu 0-2, Al 0-1.5, C 0.3-0.5, Nb 0-0.4, Ta 0-0.4, Ti  
0-0.4, S 0.1-0.2, N 0-0.2, Se 0-0.2, Zr 0-0.2 (9CI) (CA INDEX NAME)

MF C . Al . Co . Cr . Cu . Fe . Mn . Mo . N . Nb . Ni . S . Se . Si . Ta  
. Ti . V . W . Zr

CI **AYS**

SR CA

LC STN Files: CA, CAPLUS, USPATFULL

Component	Component Percent	Component Registry Number
Fe	55 - 98	7439-89-6
Cr	0.5 - 15	7440-47-3
Co	0 - 5	7440-48-4
Ni	0 - 4	7440-02-0
V	0 - 4	7440-62-2
Mo	0 - 3.5	7439-98-7
W	0 - 3.5	7440-33-7
Si	0.7 - 2	7440-21-3
Mn	0.1 - 2	7439-96-5
Cu	0 - 2	7440-50-8
Al	0 - 1.5	7429-90-5
C	0.3 - 0.5	7440-44-0
Nb	0 - 0.4	7440-03-1

Ta	0	-	0.4	7440-25-7
Ti	0	-	0.4	7440-32-6
S	0.1	-	0.2	7704-34-9
N	0	-	0.2	17778-88-0
Se	0	-	0.2	7782-49-2
Zr	0	-	0.2	7440-67-7

1 REFERENCES IN FILE CA (1962 TO DATE)

1 REFERENCES IN FILE CAPLUS (1962 TO DATE)

L32 ANSWER 3 OF 7 REGISTRY COPYRIGHT 2003 ACS

RN 345953-86-8 REGISTRY

CN Iron alloy, base, Fe 36-95,Cr 5-50,Cu 0-2.5,Mo 0-2.5,Ni 0-2,W 0-2,Mn 0-1.5,Si 0-1.5,Nb 0-0.5,Ti 0-0.5,V 0-0.3,Zr 0-0.3,Al 0-0.2,C 0-0.1,misch metal 0-0.1,N 0-0.1,P 0-0.1 (9CI) (CA INDEX NAME)

MF C . Al . Cr . Cu . Fe . Mn . Mo . N . Nb . Ni . P . Si . Ti . V .  
Unspecified . W . Zr

CI AYS

SR CA

LC STN Files: CA, CAPLUS, USPAT2, USPATFULL

Component	Component Percent	Component Registry Number
Fe	36 - 95	7439-89-6
Cr	5 - 50	7440-47-3
Cu	0 - 2.5	7440-50-8
Mo	0 - 2.5	7439-98-7
Ni	0 - 2	7440-02-0
W	0 - 2	7440-33-7
Mn	0 - 1.5	7439-96-5
Si	0 - 1.5	7440-21-3
Nb	0 - 0.5	7440-03-1
Ti	0 - 0.5	7440-32-6
V	0 - 0.3	7440-62-2
Zr	0 - 0.3	7440-67-7
Al	0 - 0.2	7429-90-5
C	0 - 0.1	7440-44-0
Misch metal	0 - 0.1	8049-20-5
N	0 - 0.1	17778-88-0
P	0 - 0.1	7723-14-0

1 REFERENCES IN FILE CA (1962 TO DATE)

1 REFERENCES IN FILE CAPLUS (1962 TO DATE)

L32 ANSWER 5 OF 7 REGISTRY COPYRIGHT 2003 ACS

RN 222720-06-1 REGISTRY

CN Iron alloy, base, Fe 70-92,Cr 8-13,Co 0-5,W 0-4,Mo 0-2,Mn 0-1.5,Cu 0-1,Si 0-1,V 0.1-0.5,Ni 0-0.5,Hf 0-0.3,Ta 0-0.3,Zr 0-0.3,C 0.1-0.2,Nb 0-0.2,Ti 0-0.2,N 0-0.1 (9CI) (CA INDEX NAME)

MF C . Co . Cr . Cu . Fe . Hf . Mn . Mo . N . Nb . Ni . Si . Ta . Ti . V  
. W . Zr

CI AYS

SR CA

LC STN Files: CA, CAPLUS

Component	Component Percent	Component Registry Number
Fe	70 - 92	7439-89-6

Cr	8	-	13	7440-47-3
Co	0	-	5	7440-48-4
W	0	-	4	7440-33-7
Mo	0	-	2	7439-98-7
Mn	0	-	1.5	7439-96-5
Cu	0	-	1	7440-50-8
Si	0	-	1	7440-21-3
V	0.1	-	0.5	7440-62-2
Ni	0	-	0.5	7440-02-0
Hf	0	-	0.3	7440-58-6
Ta	0	-	0.3	7440-25-7
Zr	0	-	0.3	7440-67-7
C	0.1	-	0.2	7440-44-0
Nb	0	-	0.2	7440-03-1
Ti	0	-	0.2	7440-32-6
N	0	-	0.1	17778-88-0

1 REFERENCES IN FILE CA (1962 TO DATE)

1 REFERENCES IN FILE CAPLUS (1962 TO DATE)

L32 ANSWER 7 OF 7 REGISTRY COPYRIGHT 2003 ACS

RN 172617-45-7 REGISTRY

CN Iron alloy, base, Fe 0-99, Cr 0.4-21, Co 0-21, Ni 0-18, W 0-18, Mo 0-5, V 0-3, Si 0-2.5, Ti 0-2.5, Cu 0-2, C 0.2-1.5, Al 0-1.2, Nb 0-1.2, Ta 0-1.2, Zr 0-1.2, Mn 0-1, N 0-0.5 (9CI) (CA INDEX NAME)

MF C . Al . Co . Cr . Cu . Fe . Mn . Mo . N . Nb . Ni . Si . Ta . Ti . V  
 . W . Zr

CI AYS

SR CA

LC STN Files: CA, CAPLUS, USPATFULL

Component	Component Percent	Component Registry Number
Fe	0 - 99	7439-89-6
Cr	0.4 - 21	7440-47-3
Co	0 - 21	7440-48-4
Ni	0 - 18	7440-02-0
W	0 - 18	7440-33-7
Mo	0 - 5	7439-98-7
V	0 - 3	7440-62-2
Si	0 - 2.5	7440-21-3
Ti	0 - 2.5	7440-32-6
Cu	0 - 2	7440-50-8
C	0.2 - 1.5	7440-44-0
Al	0 - 1.2	7429-90-5
Nb	0 - 1.2	7440-03-1
Ta	0 - 1.2	7440-25-7
Zr	0 - 1.2	7440-67-7
Mn	0 - 1	7439-96-5
N	0 - 0.5	17778-88-0

1 REFERENCES IN FILE CA (1962 TO DATE)

1 REFERENCES IN FILE CAPLUS (1962 TO DATE)